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Zahl, P. A., & Hutner, S. H., 250.
Zittle, C. A. See Wiener, M., et al., jt. authors, 237.

REVIEW ARTICLES

(1) "**Antibacterial Agents derived from Micro-Organisms.**"

(2) "**The Present Position of Phenothiazine as an Anthelmintic.**"

Reprints (price 1/- and 1/6 respectively) obtainable from: Central Sales Branch (Imperial Agricultural Bureaux), Agricultural Research Building, Penglais, Aberystwyth.

The Editor will be glad to receive publications relating to Veterinary Science and cognate subjects in order that they may be dealt with in the *Veterinary Bulletin*.

Reports of Departments, Special Reports, reprints, etc., etc., should be sent as soon as they are issued.

Books for Review.

The Editor will be glad to receive books for review in the *Veterinary Bulletin*.

Bulletins on disease subjects written for farmers and "popular" articles of a similar nature are not included in the *Veterinary Bulletin*. Those of a sufficiently important nature, are, however, included in *Index Veterinarius*; so also are certain review articles, presidential addresses, congress proceedings, etc., where the title conveys as much information as could be given in an abstract of a few lines. For information of this nature, readers of the *Veterinary Bulletin* are referred to *Index Veterinarius*, where titles of all publications indexed by the bureau are fully cross-referenced.

A list of annotations and reviews, classified according to subject, is now given in *Index Veterinarius*, being inserted at the end of each number. Such papers will not necessarily be dealt with in the *Veterinary Bulletin*.

NOTE.—In certain cases it is not possible to check references in the original publication. Such references are marked with an asterisk.

IMPERIAL BUREAU OF ANIMAL HEALTH

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DISEASES CAUSED BY BACTERIA AND FUNGI

MUDD, S., & WIENER, M. (1942). **The Antigenic Structure of Hemolytic Streptococci of Lancefield Group A. XI. Relationships of the Nucleoproteins of Some Species of Streptococci and Pneumococci.**—*J. Immunol.* **46.** 21–28. [For previous parts, see *V. B.* **12.** 566]. **1575**

WIENER, M., ZITTLE, C. A., & MUDD, S. (1942). **The Antigenic Structure of Hemolytic Streptococci of Lancefield Group A. XII. Antigenicity of the Type-specific M-protein.**—*Ibid.* 29–37. **1576**

XI. In an investigation of those non-reactive nucleoproteins of streptococci and pneumococci which can be brought into solution by sonic disintegration of the bacterial cells [see MUDD & LACKMANN—*V. B.* **11.** 422.], preparations from two strains of group A haemolytic streptococci, four strains of group B haemolytic streptococci, two strains of " green-producing " streptococci, and two strains of non-encapsulated pneumococci were tested. Group A haemolytic streptococci were found to contain nucleoproteins more closely related to those of the pneumococcus than to those of group B organisms, while the *Streptococcus viridans* strains appeared to belong to an entirely different group as far as their nucleoprotein components were concerned.

The reactivities of immune sera prepared from intact and from sonically disintegrated group A organisms were essentially the same, showing considerable cross-reactions with pneumococcal neutral sonic filtrates, and little or no precipitation with similar preparations from group B organisms and from *Str. viridans*. On the other hand, while antiserâ produced by the injection of intact group B streptococci showed practically no cross-reactivity, antisera produced by the injection of sound-treated vaccine gave strong cross-reactions with group A organisms, and with pneumococci. This appears to indicate that, while the type- and group-specific carbohydrates of group B haemolytic streptococci are located on the surface of the organisms [see LANCEFIELD—*V. B.* **4.** 199.], the nonspecific nucleoprotein is deep-seated and is only released and of serological significance when the cell is broken up.

XII. As a sequel to the authors' previous studies of the physical and chemical properties of the type-specific M-protein of group A haemolytic streptococci [see ZITTLE *et al.*—*V. B.* **11.** 422 & **12.** 566.], this investigation deals with the antigenicity of the M-protein. The production of anti-M-protein rabbit sera and the subsequent mouse protection afforded by such sera indicated that the M-protein was antigenic and concerned with the stimulation of protective antibodies. This result was confirmed by the fact that absorption of the mouse-protecting rabbit sera with M-protein rendered them ineffective for protective purposes. The intact streptococcal cells, however, exhibited a much higher degree of antigenicity than did the isolated M-protein. In an attempt to simulate a simplified streptococcal cell, the M-protein was adsorbed on aluminium hydroxide. The results were, however, disappointing.—J. LOCHIEL MCGIRR.

ROWLAND, S. J. (1942). **Variations in the Non-Fatty Solid Constituents of Milk, Their Cause and Significance.**—*Chem. Indust.* **61.** 252–254. **1577**

A survey of the solids-not-fat content of half a million samples of milk is given. The influence of subclinical mastitis on the solids-not-fat content of milk is shown by the bacteriological examination and determination of the solids-not-fat content in 247 quarter samples, 121 of which were found infected. Seventy-six (68%) of these infected milk samples were below the legal presumptive minimum of 8·5% solids-not-fat. The casein content of infected milks was found to be reduced, with a simultaneous rise in globulin-albumin content. The gold-sol test which reflects changes in the protein distribution in the milk is suggested by R. to be a promising test for the detection of early cases of mastitis.—B. WEITZ.

—. (1942). **Anthrax at the Herman Park Zoo in Houston, Texas.**—*Vet. Med.* **37.** No. 1. p. xviii. **1578**

Three mountain lions, three honey bears, a badger, a leopard, a tiger, a fox, an owl, a jaguar, a civet cat, a bobcat, and a Longhorn steer died from anthrax at this zoo. All carnivores and all animals in cages near to the infected animals were vaccinated. Two cases of infection in human beings, one a keeper and one a small boy [no details given], were reported.

HASTINGS, E. G. (1942). **The Eradication of Bovine Tuberculosis.**—*J. Dairy Sci.* **25.** 1057–1065. **1579**

H. reviews the situation regarding the control of bovine TB. in the U.S.A., giving figures for the percentage of reactors each year between 1917 and 1941 and some data from selected states. The disease has been virtually eradicated, though a few animals continue to react to the tuberculin test, most of the reactions being nonspecific. H. suggests that reactors should not now be slaughtered as they are, generally speaking, infected only with harmless mycobacterial organisms. —J. E.

HEDSTRÖM, H. (1942). Demodicos hos nötkreatur och eventuell förekomst av ospecifik tuberkulinallergi vid densamma. **[Demodectic Mange in Cattle Causing Non-Specific Tuberculin Allergy].**—*Skand. VetTidskr.* **32.** 721–764. [English and German summaries]. **1580**

Among nearly 400 pieces of excised skin lesions, chiefly from tuberculin-reacting cattle, which were sent for diagnosis, H. found *Demodex* mites in 26 while 20 other pieces appeared to be healed or healing demodectic lesions.

The 26 definite cases came from all parts of Sweden, from cattle of all ages from 1–16 years, and from 22 different herds. A table gives the salient points of interest, including the results of tuberculin tests of these cases. Most of these were positive or doubtful reactors and only a few negative reactors. A few of the affected cattle were slaughtered and found P.M. to be free of TB., and it was assumed that the remainder were also non-tuberculous.

The demodectic lesions were small nodules varying from the size of a rice grain to that of a hazel nut, accompanied in some cases by eczematous changes of the skin. The hair was usually intact and there was neither suppuration nor pruritus. Predilection sites for the skin lesions were the neck, shoulder, and upper part of the fore-limb. The histology of the nodules is described but not the parasite, though the literature on demodectic mange in cattle is reviewed.

In order to investigate the history of the affected herds, the tuberculin test results of 20 of the herds were obtained and are presented in tables. From considerations of these it appears that the demodex infestations might have been associated with the reactions observed, though this new theory requires much further investigation.—J. E.

Ascoli, A. (1942). **Increase of Specific and Non-Specific Resistance by the Transplantation of Attenuated Tubercle Bacilli Nodules.**—*J. Immunol.* **45.** 141–155. **1581**

Experiments are described which indicate that resistance to TB. was increased in unvaccinated calves by transplanting into their dewlap young nodules from a calf that had been vaccinated with " I.V.A. 80 vaccine " (the vaccine of the *Istituto Vaccinogeno Antitubercolare*, obtained from a highly virulent strain of bovine tubercle bacilli attenuated by 80 passages on glycerolated potato medium containing bile). The nodule so produced in one calf was grafted into two other calves which, 42 days later, received 0·1 mg. of virulent tubercle bacilli. A control unvaccinated calf was given a similar injection. P.M. examination four months later showed that no specific lesions developed in the two calves which were recipients of the nodules, but definite processes of miliary TB. were found in the control calf.—E. J. M. H.

MacNalty, A. S. (1942). **Tuberculosis in Peace and War.**—*Tubercle, Lond.* **23.** 263–284. **1582**

The rise of the National Tuberculosis Service in the British Isles is described and the progress made in control of the disease in man up to the outbreak of the present war is reviewed. Tables are given showing the increase in the disease during the war period 1914–18 and the fall during the subsequent period 1919–38. The causes of the fluctuation in TB. morbidity are discussed and the measures are noted which are being taken to avoid, as far as possible, a repetition of the increase in the disease which occurred in 1914–18.

A short section on nutrition and on milk in relation to the incidence of TB. is of special interest to veterinary readers.—R. E. Glover.

van Deinse, F. (1941). Modifications de la virulence du bacille tuberculeux bovin au cours des réensemencements successifs sur pomme de terre biliée. **[Changes in Virulence of Bovine Type Tubercle Bacilli in the Course of Successive Transplants on Bile-Potato Medium].**—*Ann. Inst. Pasteur.* **66.** 191–203. **1583**

The author studied the effects of continuous passages on bile-potato medium of five bovine type strains of tubercle bacilli in conditions similar to those in which the modifications occurred which led to the development of the BCG culture. A hundred passages had been made and during that time all the strains had lost their virulence for g. pigs partially or totally, but had retained more or less full pathogenicity for rabbits.

It was noticed that a rapidly fatal disease rather like the Yersin type, such as is caused in rabbits by avian type bacilli, was set up by bovine type bacilli after 25–68 passages on bile-potato medium, but in this case there was a massive lung lesion to be seen also (" *Yersin* " *avec granulie pulmonaire*), but no typical TB. lesions. This effect is evidently a function of partial attenuation and may perhaps be lost on further passage.—J. E.

Drea, W. F. (1942). **Growth of Small Numbers of Tubercle Bacilli, H37, in Long's Liquid Synthetic Medium and some Interfering Factors.**—*J. Bact.* **44.** 149–161. **1584**

Because of previous irregular results obtained by inoculating Long's synthetic medium with small amounts of human tubercle bacilli (strain H37), D. initiated this investigation, and found that inhibiting contaminating materials in very small amounts could unknowingly be introduced into the medium.

Flask-stoppers of bleached non-absorbent, non-bleached non-absorbent, and bleached absorbent cotton were found to be the main source of such contaminants, the inhibitory substances being given off as distillates from the plugs during sterilization. The necessity of using chemically clean glass-ware was also demonstrated, less than one part per million of soap (in the form of sodium oleate) being found capable of completely inhibiting bacterial growth. An important point was the fact that the addition of serum to the medium apparently neutralized the inhibitory effect of these contaminants, suggesting the need for strict precautions in growth-promotion studies and the necessity of considering the neutralization of possible, accidentally introduced, inhibitory contaminants by the added substance.

Observing strict precautions against the introduction of inhibitory contaminants, and using thoroughly dispersed bacterial suspensions, inocula of 10^{-7}–10^{-8} mg. of bacteria grew well on Long's synthetic medium.

—J. Lochiel McGirr.

Tennent, D. M., & Watson, D. W. (1942). **Molecular Kinetic Analyses and Serological Specificities of Polysaccharides Isolated from Filtrates of the Human Tubercle Bacillus and Related Species.**—*J. Immunol.* **45.** 179–186. **1585**

Polysaccharides from culture filtrates of human, bovine, and avian tubercle bacilli, a leprosy bacillus, and a *Mycobacterium phlei* were investigated, only the most readily isolated fractions being examined. All of the materials, except the bovine which was obtained from a crude protein fraction (19·6% carbohydrate), were derived from unheated culture filtrates after protein precipitation by trichloracetic acid or ammonium sulphate, the polysaccharides being isolated by means of the Tiselius electrophoresis apparatus.

The molecular weights of the isolated materials, as calculated from sedimentation- and diffusion-constants, were found to be 7,300 for human bacilli and *Mycobact. phlei*, 7,200 for avian, and 2,500 for the leprosy bacillus. The bovine fraction was not resolvable in the ultracentrifuge and showed extreme polydispersion in the diffusion cell. Electrophoretic studies indicated relative homogeneity for the human and leprosy materials, the others being heterogeneous with three boundaries for the *Mycobact. phlei* and avian, and two for the bovine fractions. All of the polysaccharides gave high precipitation titers with anti-H37 horse serum, a result indicating genus- rather than species-specificity.—J. L. McGirr.

FRANCIS, J. (1943). **Infection of Laboratory Animals with** *Mycobacterium johnei*.—*J. comp. Path.* **53.** 140–150. **1586**

Young mice about 15 days old were inoculated intraperitoneally twice, at an interval of seven days, with 2·5 mg. of a culture of *Mycobact. johnei*. The mice were killed between the 9th and 34th weeks: at the later period a heavy infection of the liver, spleen, and intestinal tract was discovered. Direct mouse passage was successful, the infection developing more rapidly than with the original culture. Subsequently, the experiments were complicated by the occurrence of a salmonella infection. Positive cultures were secured on Dunkin's medium in one instance 16 months after the original inoculation had been made.

The most striking features of the mouse disease were the lack of clinical symptoms or macroscopic P.M. findings and the rapid multiplication of bacilli in the liver and spleen, which occurred there sooner than in the intestine. Histologically, the changes were not unlike those occurring in cattle. The bacilli appeared to multiply intracellularly particularly in the reticulo-endothelial system. The appearance of collections of cells resembling the "symplasma" stage described by M'Fadyean was noted, and there was a complete absence of caseation.

A slight infection was produced in young hamsters which was carried through one direct animal passage. Young rabbits and g. pigs were less susceptible. The successful results obtained are attributed by F. to the use of very young animals which were inoculated before any age resistance was likely to have developed.

—R. E. GLOVER.

BERNHEIM, F. (1942). **The Oxidation of Benzoic Acid and Related Substances by Certain Mycobacteria.**—*J. biol. Chem.* **143.** 383–389. **1587**

The ability of two human strains of *Mycobacterium tuberculosis* (H37 and B_1) to oxidize benzoic acid and related substances was compared with that of a non-pathogenic unnamed species of *Mycobacterium*. The results, obtained by the Warburg technique, indicated that both species oxidized benzoate, that *Mycobact. tuberculosis* oxidized *o*-hydroxybenzoate but not *m*- or *p*-hydroxybenzoate, and that the non-pathogenic species oxidized *m*- and *p*-hydroxybenzoate but not the *o*-compound. All the aromatic and aliphatic aldehydes tested were oxidized with the exception of furfural. The non-pathogenic species also oxidized glucose, lactate, pyruvate, phenol, and tyrosine. The effect of two iodine-substituted aromatic compounds on the bacterial oxidation processes was also investigated.

—J. LOCHIEL MCGIRR.

FROBISHER, M., Jr., & PARSONS, E. I. (1943). **Resistance against Toxigenic** *Corynebacterium diphtheriae* **in Rabbits Following Injections of Nontoxigenic Diphtheria Bacilli.**—*Amer. J. Hyg.* **37.** 53–66. **1588**

Rabbits vaccinated with a series of injections of broth culture of avirulent non-toxigenic *Corynebact. diphtheriae* were shown to have developed a peculiar form of resistance to an intradermal test infection. The vaccine was given by several different routes, but no conclusions on this point were reached. The test attack, after inoculation of virulent culture and toxin, was severe and few of the vaccinated animals survived, although the period between infection and death was in many cases lengthened.

The lesion in these test rabbits was characterized by marked and often sharply defined oedema which suggested that there was increased resistance to the spread of the products of the infection focus. Such animals remained bright and active until an hour or so before death, when the sudden general diffusion of the toxic products caused their collapse and death. Tests showed that these animals had no demonstrable antitoxin but that their resistance was due to antibacterial antibodies rather than to antitoxin. Similar earlier experiments with mice and g. pigs had given very poor results, but mice were used to show that avirulent strains of *Corynebact. diphtheriae* produced characteristic neuromuscular symptoms when injected by the intracerebral route, exactly as did virulent strains when their toxin had been neutralized. There is a certain amount of discussion on the nature of these phenomena and on the importance of somatic antigens in diphtheria prophylaxis.—J. KEPPIE.

ROLLE. (1942). Diagnose und Bekämpfung des Maleus nach Angaben einiger russischer Forscher. **[Russian Methods of Diagnosis and Control of Glanders].**—*Dtsch. tierärztl. Wschr.* **50.** 329–330. **1589**

This is a review of articles [references not traced] by VISHELESSKIĬ, MILOVSOROV, and GLUKHOV, detailing the procedures used in detecting glanders in Russia. For the diagnosis of active glanders in adult horses, the following tests are used :– (1) clinical examination ; (2) the ophthalmic test, repeated after six days ; (3) the complement-fixation test ; (4) if (2) gives a positive result but (3) a negative result, 2 ml. of mallein are injected subcutaneously, with c.-f. tests after 9- and 15-day intervals ; (5) intravenous injection of dead glanders bacilli to provoke a glanders-like syndrome. If the horse is an active case, it is slaughtered ; quiescent or latent cases are isolated and not used for breeding. The first four of the five tests mentioned are used to detect glanders in foals.—E. COTCHIN.

DAWSON, F. L. M. (1942). **Pulmonary Pasteurellosis in Home-Reared Cattle.**—*Vet. Rec.* **54.** 508. **1590**

A brief clinical note concerning the death of a cow and its eight-month-old calf, diagnosis being based on the history, lesions, and the demonstration of bipolar bacilli microscopically.—M. H. KYAW.

*AMBROSIONI, P. (1941). **[Haemorrhagic Septicaemia in a Lion].**—*Clin. vet., Milano.* **64.** 331–336. [Abst. from abst. in *Wien. tierärztl. Mschr.* **29.** 235]. **1591**

Pasteurella feliseptica was recovered from a lion dying in Rome Zoo. TB. of the lungs due to human type infection was also present.

BEACH, B. A., IRWIN, M. R., & FERGUSON, L. C. (1942). **The Response of "Ceased" Reactors in Bang's Disease to Reexposure.**—*J. agric. Res.* **65.** 523–532. **1592**

The animals included in these experiments were grouped in two herds, each of which contained "ceased" reactors and a number of cattle believed to be free from *Brucella abortus*. All these animals were exposed to artificial infection during pregnancy. Examinations for *Br. abortus* were made at calving or abortion and also animals were killed and examined. Only one of 16 of the re-exposed animals aborted when subjected to a second exposure. This animal was found to be infected as was also one which calved normally. In general the agglutination titres of the "ceased" reactors were either lower or approximately the same during the second as during the first infections. These results tend to show that an active immunity follows infection with virulent organisms, and that the immunity is of relatively long duration.—S. J. GILBERT.

—. (1942). **Undulant Fever on a Farm.**—*Mon. Bull. emerg. publ. Hlth Lab. Serv., Lond.* July. pp. 7–8. **1593**

A case is recorded of undulant fever in the wife of a dairy farmer. Three cows which gave birth to pre-

mature calves and which had been attended by the patient at the time of parturition all yielded cultures of *Brucella*.—S. J. GILBERT.

LEYS, D. G. (1943). **Abortus Fever.**—*Brit. med. J.* Feb. 13th. 187–189. **1594**

A description is given of eight cases of undulant fever.—S. J. GILBERT.

SCHOOP. (1941). Labmagenpararauschbrand (Bradsot) und Gigasintoxikation der Schafe. [**"Northern" and German** *Bradsot* **Intoxication of Sheep**].—*Berl. Münch. tierärztl. Wschr.* March 7th. 109–113. **1595**

This article is a further contribution to the discussion concerning the identity of "northern" *bradsot* (braxy due to *Cl. septicum*) and *bradsot* as it occurs in Germany. S., who has had experience of both forms of the disease, supports the view of the Miessner school which considers that the form met with in Germany is due to the same causal organism as the Australian black disease, namely *Cl. oedematiens*. In Germany this organism is referred to as *Bacillus gigas*.

Both the German form and the "northern" form of the disease are described in detail and a comparison of the epidemiological characters is presented in tabular form. Regarding the two diseases as distinct, S. proposes the name *Labmagenrauschbrand* for the "northern" variety and *Bacillus parasarkophysematos* for the name of the causal organism.—N. S. BARRON.

*JANSEN, J. (1941). [*Clostridium welchii* **Infection in Dogs**].—*Tijdschr. Diergeneesk.* **68.** 562–568. [Abst. from abst. in *Wien. tierärztl. Mschr.* **29.** 214]. **1596**

Cl. welchii was isolated evidently from gaseous infected foci under the gastric mucosa of an old dog which died after an operation for mammary tumour. It was found to be affected with enteritis, nephritis and pyometra.

Cl. welchii was isolated from the urine and from a prostate abscess of another dog which died after castration for enlarged prostate and after showing fever and haematuria.

HAZEN, E. L. (1942). **Differential Characters of Two Strains of** *Clostridium botulinum*, **Type E: Action of Toxins in Chickens.**—*Proc. Soc. exp. Biol., N.Y.* **50.** 112–114. **1597**

Two strains of *Cl. botulinum* Type E were used, one being isolated from German-canned sprats and the other from Nova Scotian smoked salmon. Differences between the agglutination and absorption tests and between the colony formations on horse-blood agar slopes of the two strains showed them to be of distinct serologic groups.

G. pigs, mice, rabbits, and kittens were all highly susceptible to the salmon toxin but not to the toxin isolated from canned sprats.

White leghorn chicks, 4-12 weeks old and weighing 210–525 g., were dosed subcutaneously with the toxin filtrate from both cultures. Nine chicks were dosed with 300–4,000 g.-pig M.L.D. of the sprat toxin and 20 were dosed with 4–300 g.-pig M.L.D. of salmon toxin. Those dosed with the sprat toxin did not become ill, whereas those dosed with the salmon toxin showed symptoms characteristic of botulism, and many died.

The fatal dose for chicks weighing 230–315 g. was approximately 6–8 g.-pig M.L.D. of the salmon toxin, while doses, several hundred times as large, of the sprat toxin failed to induce any symptoms of botulism. The sprat toxin was demonstrated in the blood and excreta of some chicks 72 hours after inoculation.—A. BUXTON.

FRIEDEMANN, T. E., & KMIECIAK, T. (1941). **Metabolism of Pathogenic Clostridia in Complex Carbohydrate-Rich Culture Media.**—*Proc. Soc. exp. Biol., N.Y.* **47.** 84–87. **1598**

The literature on the carbohydrate metabolism of the clostridia is briefly reviewed and a study made of five species of pathogenic clostridia. The tests were made on young rapidly growing cultures after incubation for 10–24 hours in an atmosphere of pure nitrogen. The yield of formic acid in comparison with the sum of the yields of acetic acid and ethyl alcohol was large in the case of *Cl. welchii* and *Cl. septicum*, but less so with *Cl. sporogenes*, *Cl. tetani*, and *Cl. botulinum*.

Lactic acid was produced by *Cl. welchii*, *Cl. septicum*, and *Cl. sporogenes* in that order. Butyric acid in small but measurable amounts was a feature of the metabolism of these clostridia and it is not known whether it was derived from sugar or from amino acids. The results differed from those given in the literature; it is suggested that this is because the study of young cultures excluded secondary reactions involving the production of formic, acetic, and lactic acids. As in the case of many other rapidly growing pathogens, it was shown that a large part of the carbohydrate is either converted into lactic acid or is further metabolized to yield approximately 2 molecules of formic acid, and 1 molecule each of acetic acid and ethyl alcohol.—J. K.

GOSS, L. J. (1942). **Tetanus in an Elephant** (*Elephas maximus*).—*Zoologica, N.Y.* **27.** 5–6. **1599**

Case record of tetanus with recovery in an eight-year-old Indian elephant at New York Zoological Park. Treatment was by tetanus antitoxin (360,000 units given over four days) plus chloral hydrate *per rectum* (6 oz. during one day).—J. E.

MUELLER, J. H., & MILLER, P. A. (1942). **Growth Requirements of** *Clostridium tetani*.—*J. Bact.* **43.** 763–772. **1600**

In tests on a single strain of *Cl. tetani* chosen on account of its high toxicity, the following substances in addition to the usual inorganic elements were shown to be essential for growth and good toxin production :– an acid hydrolysate of protein (casein), trytophane, a small quantity of adenine or hypoxanthine, pantothenic acid (the synthesized form was proved suitable), thiamine, riboflavin, "folic acid" and probably biotin. One or more additional factors such as are to be found in whole casein, and a liver extract, may be essential.

—J. KEPPIE.

VINK, H. H. (1941). [**Mucor Mycosis in a Pig**].—*Tijdschr. Diergeneesk.* **68.** 312–315. [Abst. from abst. in *Wien. tierärztl. Mschr.* **29.** 211]. **1601**

Case record of a very big abscess originating in the subiliac lymph node of a six-month-old pig, with similar but smaller abscesses of the mandibular lymph nodes. A mould fungus, *Absidia lichtheimi*, was isolated.

STILES, G. W., & DAVIS, C. L. (1942). **Coccidioidal Granuloma (Coccidioidomycosis). Its Incidence in Man and Animals and its Diagnosis in Animals.**—*J. Amer. med. Ass.* **119.** 765–770. **1602**

After a brief general discussion on infection with the fungus *Coccidioides immitis* in man and animals in North America, the authors report the laboratory diagnosis of 78 cases in cattle slaughtered in Denver, Colorado, but coming from six separate states. Tissues examined were enlarged thoracic lymph nodes having TB.-like lesions.

Diagnosis was effected either by smear or culture on meat-infusion agar and also in some cases by histological tissue sections. The appearance of the organism so seen is illustrated. An allergic diagnostic method is said to be available. [It would appear important to study the tuberculin sensitivity of affected cattle.]

—J. E.

DE BOER, E., & SOEMANAGARA, R. (1941). Werking van NaOH-oplossingen op eenige Gram-positieve en

Gram-negatieve bacterie-soorten. **[Action of Sodium Hydroxide Solutions on Gram-Positive and Gram-Negative Bacteria].**—*Ned.-ind. Bl. Diergeneesk.* **53.** 341–346. [English summary]. **1603**

The solvent and killing action of NaOH solution on seven Gram-negative and two Gram-positive organisms was studied with the object of ascertaining the value of NaOH in routine disinfection. Suspensions of the organisms were made in distilled water and standardized to equal opacity in each case. To these suspensions decreasing concentrations of NaOH solution were added. In the case of five Gram-negative organisms a concentration of 0·08% NaOH was sufficient completely to dissolve the suspension. The same result was obtained by a concentration of 0·12% NaOH for *Salmonella typhi-murium* and 0·8% for *Brucella abortus* and the staphylococcus, but in the case of the streptococcus a 2% concentration did not give a complete solution of the organisms. Viability tests were made against time from 24-hour broth cultures diluted with physiological saline and again using decreasing concentrations of NaOH solutions. In this case the two Gram-positive organisms were found to be very resistant as compared to the Gram-negative organisms studied. The authors conclude from these results that the effect of NaOH on Gram-negative organisms is greater than in the case of Gram-positive bacteria.—B. Weitz.

Park, C. R., & Wood, W. B., Jr. (1942). **p-Aminobenzoic Acid as a Metabolite Essential for Bacterial Growth.**—*Johns Hopk. Hosp. Bull.* **70.** 19–25. **1604**

The basal synthetic medium growth of two strains of *Clostridium acetobutylicum* was unaffected by the addition of biotin, and only slightly accelerated by introducing small quantities of *p*-aminobenzoic acid, the authors being unable to confirm Rubbo & Gillespie's observation [*V. B.* **11.** 433.] that *p*-aminobenzoic acid, by itself, had a marked growth-promoting action. Together, however, these two compounds were found to exhibit marked growth-stimulating effects, concentrations of *p*-aminobenzoic acid as low as $1 \times 10^{-6}\mu$g. per ml. medium being active in the presence of $1{\cdot}5 \times 10^{-4}\mu$g. biotin. These results suggest that *p*-aminobenzoic acid is a metabolite essential for bacterial growth and is therefore involved in the mechanism of action of the sulphonamide drugs.—J. Lochiel McGirr.

See also absts. **1753-1755** (mastitis), **1668** (mastitis and TB.), **1792**, **1796** (TB.), **1634**, **1636** (pneumococcus), **1756**, **1799** (brucella), **1635** (brucella and salmonella), **1663**, **1797** (salmonella), **1770** (intestinal flora), **1678** (air-borne infection), **1795** (cultivation), **1745**, **1749**, **1752** (sulphonamide therapy), **1740-1742** (antibacterial agents).

DISEASES CAUSED BY PROTOZOAN PARASITES

Packchanian, A. (1942). **Reservoir Hosts of Chagas' Disease in the State of Texas. Natural Infection of Nine-Banded Armadillo (Dasypus novemcinctus texanus), House Mice (Mus musculus), Opossum (Didelphis virginiana), and Wood Rats (Neotoma micropus micropus), with Trypanosoma cruzi in the State of Texas.**—*Amer. J. trop. Med.* **22.** 623–631. **1605**

The animals under investigation were collected in Texas and examined for trypanosome infection by direct blood examination, blood culture, and by feeding bugs on them [xenodiagnosis]. Cultural tests proved valuable in detecting infected animals in which blood examination failed to reveal trypanosomes. Xenodiagnosis was also found to be of value.

Out of 15 armadillos, only one was found to be infected, whilst five out of eight opossums, two house mice, and 32 out of 100 wood rats were found to harbour *T. cruzi*. Some of the wood rats were found to have a double or triple infection with *T. cruzi*, *T. neotoma* [= *T. lewisi*], sarcosporidia, and microfilariae. —U. F. Richardson.

Wood, S. F. (1942). **The Persistence of Trypanosoma cruzi in Dead Cone-Nosed Bugs (Hemiptera, Reduviidae).**—*Amer. J. trop. Med.* **22.** 613–621. **1606**

Crithidia and trypanosomes were found to persist in the faeces of bugs killed by heat, and of others which had died from natural causes, for at least 15 days, and in some cases they invaded the body fluids. It is suggested that infection of rodents might be maintained by their eating dead bugs. Trypanosomes may be able to migrate from the body fluids to the salivary glands in the living bugs so that their bites may become infective.—U. F. Richardson.

Anreiter, J. (1942). Die Bekämpfung der Deckinfektion beim Rind. **[Control of Venereal Disease in Cattle].**—*Wien. tierärztl. Mschr.* **29.** 417–424. **1607**

The author relates his experiences as a specialist on breeding diseases of cattle, in a district in Upper Danube, Austria. In one year he examined 763 cattle and found *Deckinfektion*, which seems to be trichomoniasis, exclusively in 128 animals. His experience in diagnosis agrees with that of other workers [see for instance Anon and Gilyard *et al.*—*V. B.* **13.** 163.] and he agrees that the disinfection of bulls is hardly possible.

He makes suggestions for the control of trichomoniasis, suitable for the local conditions in which the farmer, breeding society, and veterinarian must work together to achieve success and he gives the text of two leaflets which he has compiled with regard to cows and bulls respectively. In his scheme he has " chief bulls " and " assistant bulls " : only cows known to be healthy are permitted service by the former.—J. E.

Morgan, B. B. (1942). **Comparison of pH and Population of *Trichomonas Foetus*.**—*Proc. Soc. exp. Biol., N.Y.* **51.** 380–382. **1608**

In investigating the pH requirements of four strains of *T. foetus* cultivated on bovine blood slants covered with citrate serum and incubated at 37°C., M. found that two strains reached maximum numbers at pH 6·1–6·3 in 96 hours, one strain reached maximum numbers at pH 5·3–5·6 in 72 hours, whilst the fourth strain, which was contaminated with *Corynebacterium renalis*, reached maximum numbers at pH 5·7–5·9 in 48 hours.—U. F. Richardson.

*Geurden, L. M. G., & Willems, A. E. R. (1941). **[Cultivation of Trichomonads in Developing Eggs].** —*Tijdschr. Diergeneesk.* **68.** 955–960. [Abst. from abst. in *Wien. tierärztl. Mschr.* **29.** 361]. **1609**

The hen's egg appears to possess considerable resistance to infection with *T. foetus*, as is shown by the local reaction produced, although the organism is toxic to embryonal chicken tissue. If *T. foetus* is inoculated into a killed chicken embryo, lysis of the embryo and chorioallantoic membrane follows. This process is said to be similar to that occurring in pyometra of cattle. *T. hepatica* is very toxic to the chicken embryo at any age. Both trichomonads when cultured in eggs show large numbers of granules in the cytoplasm. —U. F. Richardson.

Machul'skiĭ, S. N. (1938). Koktsidioz karakulevykh ovets na yuge Ukrainy. **[Coccidiosis of Karakul Sheep in South Ukraine].**—*Rev. Microbiol., Saratov.* **17.** 183–200. [French summary]. **1610**

M. briefly reviews the literature on the subject and gives a number of references. On the farm where the investigations were carried out, considerable losses had occurred. Of the 86 sheep examined, all were found to be infected by one or more species of *Eimeria*, the various species occurring in the following order of frequency :—*Eimeria ninae-kohl-yakimovi* (86%), *E. arloingi* (55·8%), *E. galouzoi* (54·7%), *E. parva* (41·9%), *E. faurei* (27·9%), and *E. intricata* (13·9%). All six of these species might be found in a single animal. The sheep had helminth infestations, but these were not considered to be responsible for the losses.—E. R. P.

MACHUL'SKIĬ, S. N., & TIMOFEEV, P. S. (1940). Koktsidioz koshek v SSSR. [**Coccidiosis of Cats in the U.S.S.R.**]—*Rev. Microbiol., Saratov.* **17.** 402–407. [French summary]. **1611**

The authors give references and a summary of previous work and describe their own investigations. 106 cats from the Leningrad district were examined, and 13·2% were found to be infected by coccidiosis. *Isospora felis*, *I. rivolta* and *I. bigemina* were all observed. These are described in detail, as well as their oocysts. The digestive tract of the cats was mainly affected.
—E. R. PARISER.

HEWITT, R. I., RICHARDSON, A. P., & SEAGER, L. D. (1942). **Observations on Untreated Infections with *Plasmodium lophurae* in Twelve Hundred Young White Pekin Ducks.**—*Amer. J. Hyg.* **36.** 362–373. **1612**

The host-parasite relationship existing between ducks and *P. lophurae* has proved an extremely useful one for the investigation of the chemotherapy of malaria. Ducks can be easily reared in large numbers and have the additional advantage of being highly susceptible to *P. lophurae* infections. As a result, the empirical approach to the testing of plasmodicidal drugs has been simplified. The authors have described observations on the course of untreated infections in ducks with a view to standardizing procedures for later studies on the experimental chemotherapy of malaria. They have examined the relationship between the dose of parasites inoculated and the outcome of infections, as well as the effects produced by different doses of parasites in birds of different ages. It was found that one of the most important requirements for the production of uniform infections within a single series of animals of identical age was to inoculate a given number of parasites per kg. body weight. It is hoped that this attempt to standardize procedure in its widest sense will enable workers to measure quantitatively and qualitatively the action of the plasmodicidal compounds which they are investigating.—C. HORTON SMITH.

PORTER, R. J. (1942). **The Tissue Distribution of Exoerythrocytic Schizonts in Sporozoite-Induced Infections with Plasmodium cathemerium.**—*J. infect. Dis.* **71.** 1–17. **1613**

In the exoerythrocytic development of malarial parasites there appear to be at least two phenomena involved. Workers have pointed out that in certain avian malarias the exoerythrocytic large schizonts are structurally distinct from the classical stages found in the erythrocytes. As the study of the type of cells infected has been neglected, confusion has occurred in the literature, and it was with a view to elucidating the position of *P. cathemerium* that the present investigation was made. The work deals with the incidence of exoerythrocytic stages in different laboratory strains and the changes in their distribution during the course of sporozoite-induced infections with *P. cathemerium* in the canary. Exoerythrocytic schizonts have been found in birds infected with five virulent strains, but were not traced in eight other less pathogenic strains. A study of tissue sections from birds inoculated with sporozoites of various strains revealed exoerythrocytic schizonts almost entirely in the macrophages of the liver, spleen, and bone marrow during the earlier infection. In more advanced infections, numerous parasites were found in the endothelium and capillaries throughout the body, as well as locally in intravascular accumulations of macrophages in all organs. P. suggests that the early stages occurring in macrophages are concerned with sporozoite development and that the later macrophage, endothelial, and capillary stages arise as a result of changes in the susceptibility of the host. Early and late stages of schizogony involve different processes.
—C. HORTON SMITH.

RUSSELL, P. F., & MENON, P. B. (1942). **On the Transmission of *Plasmodium gallinaceum* to Mosquitoes.**—*Amer. J. trop. Med.* **22.** 559–563. **1614**

Some of the observations made during the course of numerous attempts to transmit *P. gallinaceum* to several genera of mosquitoes are recorded. In laboratory experiments, the mosquitoes *Armigeres* and *Aëdes* were infected and were found to transmit *P. gallinaceum* quite easily. Attempts to infect anophelines failed, even when they were fed on a fowl infected with numbers of gametocytes adequate for creating 100% infection of the other two genera. Culicines did not become infected, but in one case *Culex mimuloides* was found to harbour oocysts. It is concluded that local species of *Anopheles* or *Culex* are not natural hosts for this plasmodium.—C. HORTON SMITH.

See also absts. **1757** (amoebiasis), **1641**, **1642**, **1647**, **1733**, **1758**, **1759** (trypanosomiasis), **1760** (malaria).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

—. (1941). **University of Pennsylvania Bicentennial Conference. Problems and Trends in Virus Research.** pp. 75. Philadelphia : University Pennsylvania Press. [8vo]. **1615**

ELEMENTARY BODIES OF VACCINIA [RIVERS, T. M.]—R. points out that a proper chemical and immunological investigation of vaccinia virus was not possible until elementary bodies were obtained in a state of purity. The importance of harvesting infective material at a very early state, *e.g.* not later than the third day, is stressed ; otherwise the cells disintegrate, liberating masses of particles similar in size but not related to vaccinia. Under proper conditions one e.b. may produce vaccinia, an indication that this body is the infective unit.

Attempts to demonstrate metabolic activity of virus particles have so far been unsuccessful. The latest chemical analysis of e.b. gives the following ratios :—infective unit : e.b. ratio, 1 : 4·9 ; organic phosphorus, 0·57% ; total nitrogen, 15·3% ; α-amino nitrogen, 3·4% ; carbon, 33·7% ; total lipid, 5·7% ; cholesterol, 1·4% ; phospholipid, 2·2% ; neutral fat, 2·2% ; cystine after hydrolysis, 1·9%, and reducing sugars, 2·8%.

Some information on the nature of virus particles has been obtained by a study of their specific gravity in different fluids. R. disagrees with MCFARLANE who believes that most of the water of e.b. is closely associated with their surface, on the grounds that the e.b. are permeable to water and urea, less so to glycerol, and only slightly to sucrose. Electrophoretic and ultracentrifugal studies on mixtures of e.b. and protein-coated collodion particles showed that a single sedimenting boundary cannot be accepted as conclusive evidence

of the purity of virus preparations. In general, the results so far obtained indicate that virus particles are relatively complex structures differing in many respects from entities usually regarded as molecules.

CHEMICAL PROPERTIES OF VIRUSES [STANLEY, W. M.]—S. summarizes the recent progress which has been made on the purification of viruses. He points out that the isolation of crystalline tobacco mosaic virus has been followed by the preparation from various plant viruses of over 20 crystalline or amorphous substances. Since attempts to obtain similar materials from animal sources have so far been unsuccessful, it has been thought that there must be fundamental differences between plant and animal viruses. S. draws attention to recent investigations showing that some plant viruses (*e.g.* aster yellows virus) can multiply in an insect vector: in his view, this observation brings the two groups into line with one another.

The chemical composition and structure of plant viruses is reviewed and emphasis is laid on the fact that each virus so far studied has a characteristic shape and size. Although no evidence of viral protective substances has ever been demonstrated in plants, many plant viruses in purified form act as good antigens when injected into animals, and produce specific antibodies.

THE INFLUENCE OF HOST AND INTERMEDIATE RESERVOIR HOST IN DETERMINING THE EPIDEMIOLOGIC PATTERN OF BOVINE PSEUDORABIES AND SWINE INFLUENZA. [SHOPE, R. E.]—S. contrasts the epidemiology of Aujeszky's disease in cattle which has no recognized seasonal incidence and an irregularity of spread in enzootic areas, with swine influenza which is rather strictly seasonal in its incidence, with long quiescent periods. Both diseases tend to be self-limiting and intermediate hosts are believed to be necessary to act as reservoirs.

The epidemiological facts suggest that Aujeszky's disease is not contagious in cattle but is spread through the intermediary of the pig which is often affected by an "inapparent" form of the disease (5–50% in the Middle West). The rat may play a direct role in the maintenance of the porcine disease. The widespread nature of swine influenza, on the other hand, results from its highly contagious character. According to S., persistence of the virus from year to year depends on its conservation in earthworms which have ingested embryonated eggs of the swine lungworm [see *V. B.* **12.** 87].—R. E. GLOVER.

•CORDIER, G. (1940). Symbiose "in vivo" du virus claveleux et du virus aphteux. Adsorption simultanée des deux virus par le carbone animal. [**Symbiosis *in vivo* of Sheep Pox and Foot and Mouth Disease Viruses. Simultaneous Adsorption by Animal Charcoal**].—*Rec. Méd. vét.* **116.** 254–261. [Abst. from abst. in *Bull. Inst. Pasteur.* **40.** 3]. **1616**

The pulp of a sheep-pox pustule inoculated into g. pigs along with F. & M. disease virus set up the latter infection after dilution to 1 : 8,000. A mixture of the two viruses was completely adsorbable on to bone charcoal. Reference is made to the immunization of cattle and sheep simultaneously with both viruses, although the indications for this are not clear in the abstract.

SMADEL, J. E., & HOAGLAND. C. L. (1942). **Elementary Bodies of Vaccinia.**—*Bact. Rev.* **6.** 79–110. **1617**

The authors deal with modern methods of obtaining e.b. of vaccinia and of examining their physico-chemical properties; the subjects are discussed under the following headings:– Development of Methods for the Preparation of Highly Purified Virus; Identification of the Elementary Body with the Infective Unit of Vaccinia; Criteria of Purity of Preparations of Elementary Bodies; Physical Properties; Chemical Properties, and Antigens of Vaccinia.—R. E. GLOVER.

EDWARD, D. G. FF., ELFORD, W. J., & LAIDLAW, P. P. (1943). **Studies on Air-Borne Virus Infections. I. Experimental Technique and Preliminary Observations on Influenza and Infectious Ectromelia.**—*J. Hyg., Camb.* **43.** 1–10. **1618**

A description is given of an inhalation method of infecting mice with the viruses of influenza and ectromelia respectively. In the case of influenza, broth-saline suspensions of infected lungs were atomized with an aerograph pencil spray, the mist being allowed to impinge on the bottom of a flask, so that all but very fine droplets were trapped. Suitable apparatus was devised for exposing the mice to the mist and for the collection of representative samples in centrifuge bottles containing broth, so that the virus concentration of the aerosol could be estimated in terms of mouse M.L.D.

By varying the humidity it was shown that the loss of infectivity as a result of "aging" of the mist could be controlled. Thus, with an aerosol over water, loss of virus which was only slight after 15 min., was nearly 90% at 30 min. and 99% at one hour: on the other hand, dry aerosols were much more persistent; 90% of the virus remained in suspension after one hour. The estimated particle sizes were $2{\cdot}3\mu$ over water and $1{\cdot}3\mu$ in a dry atmosphere. The concentrations of virus produced by a standard method of atomization remained quite constant under similar conditions. Experiments in mice showed that animals instilled intranasally with 0·05 ml. of fluid, in which the virus from 5 ml. original aerosol was concentrated, developed infection of like severity to that shown by mice breathing normally for 10 min. in an atmosphere in which the aerosol had been diluted tenfold. The infection transmitted to mice exposed to an influenza aerosol was more regular than that following intranasal inoculation. Evidence was obtained that as little as 1% of virus reaches the lungs.
—R. E. GLOVER.

PEERS, J. H. (1942). **Equine Encephalomyelitis (Western) in Man—a Histologic and Anatomic Study.**—*Arch. Path.* **34.** 1050–1064. [Author's summary copied *verbatim*]. **1619**

Thirteen brain specimens from 1941 epidemic encephalomyelitis in North Dakota have been subjected to detailed examination, and the histologic nature and the anatomic distribution of the lesions in them have been described and illustrated. The Western strain of the virus of equine encephalomyelitis had been isolated from seven of them.

A summary of the findings shows that the Western virus can produce in man a fatal encephalitis characterized by nodules of microgliosis, spongy areas of partial destruction of ground substance and perivascular round cell infiltration. The great majority of the inflammatory cells are mononuclear, in contrast to the predominance of polymorphonuclear leukocytes described in the Eastern type of equine encephalomyelitis. The lesions regularly appear in greatest number and severity in the anterior parts of the putamen and the caudate nuclei. In the brain stem the lesions are almost entirely proliferative rather than destructive and are distributed fairly evenly in the tegmentum and base, independent of anatomic and functional units. The number of lesions diminishes markedly in more caudal levels, and only a few small foci appear in the upper part of the cervical cord. A variable number of lesions are also present in the cerebral cortex, chiefly in the anterior portion of it, and in the cortex and the roof nuclei of the cerebellum.

HOWITT, B. F., & VAN HERICK, W. (1942). **Relationship of the St. Louis and the Western Equine Encephalitic Viruses to Fowl and Mammals in California.**—*J. infect. Dis.* **71.** 179–191. **1620**

A certain correlation has been found to exist in man between the presence of antibodies to the Western E.E. virus and those of the St. Louis strain. To determine, therefore, whether a similar relationship exists among animals, the authors tested the sera of different mammals and various types of domestic fowl for neutralizing substances against the two viruses.

Of 60 sera of domestic mammals from areas of California which are endemic for Western E.E., 93·3% neutralized this virus, 1·6% neutralized the St. Louis alone, and 61·6% were common for both strains, whilst of 36 sera of domestic mammals from supposedly non-endemic regions, 55·5% were positive for E.E., 2·7% for St. Louis alone, and the same number for both viruses. In both types of regions, the number of sera from wild animals having neutralizing properties for either virus was practically negligible.

Tests on sera from chickens, turkeys, domestic ducks and mallards, pheasants, pigeons, peacocks, a mourning dove, a Canada goose, and sparrows showed that of 161 birds from endemic areas, 43·4% were positive against the Western strain, 5·2% against St. Louis alone, and 13% against both viruses.

The opinion is given that the appearance of encephalitis among animals in an area hitherto free from the disease may be the precursor of a later outbreak amongst the human population.—J. C. BUXTON.

PLATOU, R. V. (1940). **Equine Encephalomyelitis in Infancy.**—*Amer. J. Dis. Child.* **60.** 1155–1169. **1621**

A report of infection in an infant who was probably infected within four weeks of birth. The disease was not suspected to be caused by the virus of E.E. until some months later. The blood of the patient then contained antibodies of the Western type of virus. Up to the time of writing, the patient, then 2½ years old, presented the post-encephalitic state and was considered to be mentally deficient as the result of the illness.

I. YAKUSHEV, V. I. (1939). Novoe v patogeneze entsefalomielita loshadeĭ. **[Pathogenesis of Equine Encephalomyelitis].**—*Sovyet Vet.* No. 2. pp. 20–23. **1622**

II. YAKUSHEV, V. I. (1939). Bar'ernaya rol' pecheni v patogeneze entsefalomielita. **[The Liver as a Barrier in the Pathogenesis of Equine Encephalomyelitis].**—*Ibid.* No. 12. pp. 23–26. **1623**

I. Three series of experiments were conducted in six foals, 25 dogs, 75 rabbits, and 100 mice to study the role of the liver and spleen in the spread of E.E. virus, dysentery bacteriophage being used in comparative experiments.

In the first experiment on (1) normal animals, (2) splenectomized animals, and (3) splenectomized animals deprived also of part of the liver, bacteriophage injected intravenously disappeared from the blood of group (1) within two days and persisted therein for 80 hours and four days respectively in groups (2) and (3). E.E. virus, on the other hand, quickly disappeared from the blood in all groups.

In the second experiment the animals were splenectomized and their livers were exposed by organostomy to enable samples to be removed. Bacteriophage disappeared quickly from the blood but became deposited in the liver and reached its maximum concentration therein in 80 hours. E.E. virus quickly disappeared as in the first experiment. [No data on whether E.E. virus became deposited in the liver.]

In the third experiment the liver and spleen were both exposed for sampling. Bacteriophage was found to be deposited first in the spleen and later in the liver. E.E. virus could not be recovered from spleen or liver at any time.

II. In experiments similar to those in I, neither bacteriophage nor E.E. virus given *per os* could be recovered from the blood or liver. Bacteriophage given *per rectum* was recovered from the portal blood and liver.

In other experiments it was again found (as in I) that bacteriophage after intravenous injection gradually disappeared from the blood and was gradually deposited in the liver. E.E. virus was not recovered from the blood, but was recovered from the liver. It was noticed that the intravenous injection of E.E. virus contained in brain tissue caused bilirubinaemia (up to 8 mg.%).

In discussing this observation, Y. suggests that the bilirubinaemia results in an upsetting of the blood-brain barrier whereby E.E. virus can penetrate into the central nervous system.—A. MOLDAWSKY.

FOGEDBY, E., & KOEFOED, H. (1942). Vaccination af Kvaeg mod MK med Vacciner, fremstillet af Kulturvirus adsorberet til Aluminiumhydroxyd. **[Vaccination of Cattle against Foot and Mouth Disease with Culture Virus Adsorbed on Aluminium Hydroxide].**—*Skand. VetTidskr.* **32.** 657–668. [In Danish: English summary]. **1624**

A résumé of experiments started in 1936 on the preparation of F. & M. disease vaccine from culture virus. Virus was grown on calf-embryo skin or lung tissue culture and used in the established way to make formolized adsorbate vaccine, both monovalent with O virus and bivalent with O and A viruses. Several experiments were carried out on g. pigs and bovines, but the results were not good, as some of the vaccine lots were infective and others were harmless but not antigenic. Only a few of many lots were substantially effective.

In view, however, of the far smaller cost of producing culture virus than of natural virus, work on culture virus vaccine is continuing.—J. E.

WEIL, A. J. (1942). **Agglutination by Anti-Hog Cholera Hyperimmune Sera of an Antigen Obtained from the Spinal Fluid of Pigs Infected with Hog Cholera and Adsorbed on B. prodigiosus.**—*J. Immunol.* **45.** 187–191. **1625**

No visible *in vitro* reaction is obtainable with swine fever hyperimmune serum and virus, but test-tube reactions have been demonstrated in the case of St. Louis encephalitis virus by means of the adsorption of the virus with *Chromobacterium prodigiosum* and mixing with immune serum. W. employed a similar technique with S.F. virus.

Sera were obtained from groups of pigs which were hyperimmune, immune, and susceptible respectively to S.F., and spinal fluid obtained from the same pigs by cysternal puncture immediately after slaughter, was concentrated by Kabat's method. A strain of *Ch. prodigiosum* was killed by heat, added to a volume of spinal fluid concentrate, and incubated overnight to assist adsorption. The resulting antigens were used in volumes of 0·1 ml. to which was added 0·2 ml. diluted serum and the mixtures were incubated for six hours at 45°C. Agglutination of the organism was obtained and the results are shown in tabular form, but it cannot yet be asserted that the specific results are reactions against the virus as such, since soluble antigens have been found frequently in extracts from viral material.—J. C. BUXTON.

*FOSCHI, M. (1941). **[Avian Laryngotracheitis in Italy].**—*Clin. vet., Milano.* **64.** 315–322. [Abst. from abst. in *Wien. tierärztl. Mschr.* **29.** 235]. **1626**

A description of the disease with regard to its discovery for the first time in Italy.

EDDIE, B., & FRANCIS, T., Jr. (1942). **Occurrence of Psittacosis-like Infection in Domestic and Game Birds of Michigan.**—*Proc. Soc. exp. Biol., N.Y.* **50.** 291–295. **1627**

In an investigation into the existence of ornithosis (a term suggested by MEYER for latent psittacosis in birds), complement-fixation tests were carried out with the sera of 100 pigeons from various parts of Michigan and an antigen of the virus of human meningo-pneumonitis, described by FRANCIS & MAGILL [(1938). *J. exp. Med.* **68.** 147.] and used in this work instead of ornithosis virus, because it is known that human serum which reacts to the latter also reacts to meningo-pneumonitis as well as to lymphogranuloma virus. Sixty-one of 100 pigeon sera tested gave positive results at titres of 1 : 2 – 1 : 256.

Unlike human sera, pigeon sera having complement-fixing antibodies to meningo-pneumonitis virus failed to react to an antigen of the virus of lymphogranuloma venereum. This suggests that pigeon serum may be of value in differentiating the viruses of this group.

Ornithosis virus was recovered in mice from the tissues of two out of 36 of the above pigeons examined.

Complement-fixing antibodies [presumably to meningo-pneumonitis virus] were demonstrated in the sera of 22 out of 109 domestic turkeys, five out of 24 sera of domestic ducks, and nine out of 45 sera of chickens. No c.-f. reactions were obtained with sera of 90 wild fowl.—F. D. ASPLIN.

I. ANDREWES, C. H., & MILLS, K. C. (1943). **Psittacosis (Ornithosis) Virus in English Pigeons.**—*Lancet.* **244.** 292–294. **1628**

II. THOMPSON, A. P. (1943). **Psittacosis Virus in English Pigeons. [Correspondence].**—*Ibid.* 384. **1629**

Psittacosis virus had been found to cause disease in pigeons in South Africa and in the U.S.A. and, although there is no evidence that human beings have become infected from pigeons in Great Britain, it seemed that a search should be made for the virus in view of the wide use of pigeons in the fighting services.

Tests were carried out upon birds obtained from three different sources in England and one in the U.S.A. and the presence of psittacosis virus was demonstrated in apparently healthy birds from three of the four groups, including the American group.

It is stated that atypical pneumonias, which are considered by some authors to be due to ornithosis virus, have not been described in pigeon fanciers in Great Britain, but it is suggested that it is improbable that such conditions have been looked for.

II. A letter stating that T. has been watching for evidence of ornithosis infection from birds since he described cases in 1930, and that he has seen three cases of so-called " virus pneumonitis " in the United Kingdom in persons associated with newly established fowl pens.—J. C. BUXTON.

FINDLAY, G. M. (1943). **The Action of Certain Surface-Acting Substances on Yellow Fever Virus (Neurotropic Strain): Preliminary Observations.**—*Trans. R. Soc. trop. Med. Hyg.* **36.** 247–252. **1630**

The purpose of these experiments was to determine (a) whether the neurotropic strain of yellow fever virus could be inactivated by fatty acids, soaps, and similar surface-active agents, and (b) whether the virus, inactivated in this way, retained its capacity to produce immunity. The substances found to have an inhibitory action were aconitic acid, mucic acid, sodium ricinoleate, " solgon ", " trimetso ", undecylenic acid, sodium oleate, linoleic acid, linolenic acid, malic acid, and sodium laurate. Of these substances linoleic, linolenic, malic and mucic acids as well as " tetralene " and acetyl-salicylic acid allowed the production of immunity in a proportion of mice. The experiments were done by injecting a mixture of trial substance and mouse brain infected with the virus into the experimental mice, and it is suggested that the scales were " heavily weighted against any inhibitory action " ; in further work it is proposed to use virus maintained in tissue culture.—D. G. DAVEY.

See also absts. **1761** (Aujeszky's disease), **1762** (distemper).

IMMUNITY

HERSHEY, A. D. (1941). **A Descriptive Theory of Specific Precipitation. II. Quantitative Applications. III. The Individuality of Antibody.**—*J. Immunol.* **42.** 485–513 & 515–530. [For part I, see *V. B.* **12.** 590]. **1631**

HERSHEY, A. D. (1942). **Specific Precipitation. IV. Quantitative Application of the Restricted Theory.**—*Ibid.* **45.** 39–50. **1632**

II. The " restricted theory " of specific precipitation, postulated in part I, is advanced as being adequate to explain the " small volume effect " in precipitating systems, and the variations in precipitate composition produced by excess of either antigen or antibody. Its potentialities in relation to predictions concerning the valence of antigen are discussed, and experimental methods for the measurement of the maximal valence of antigen, the maximal valence of antibody, and the dissociation constant of the unit valence are suggested. H. concludes, after considering published data from several sources, that the valence of antigen is fixed primarily by restrictions of space on the antigen surface and by the area required for the attachment of a single antibody molecule. He estimates the contact surface to be of the order 10^{-13}cm.^{2} [See also BOYD—*V. B.* **13.** 54.]

III. In this section the conclusions of parts I and II are reviewed and attempts made to fit the published figures and data on specific precipitation into the hypothesis.

IV. In a statistical approach toward the quantitative expression of the restricted theory, H. derives generalized formulae for the distribution of antibody molecules about the surface of antigen, and shows that these indicate results in agreement with random examples of antigen-antibody precipitation chosen from the literature. He points out, however, that the results achieved should not be taken as confirmation of the lattice hypothesis but that, if the independent evidence for this hypothesis is accepted, his " restricted theory " would appear to be capable of contributing to basic knowledge concerning immune reactions.

[These papers cannot be dealt with adequately in an abstract. The reader is referred to the originals for the mathematical data and formulae presented.]

—J. L. MCGIRR.

KIDD, J. G., & FRIEDEWALD, W. F. (1942). **A Natural Antibody that Reacts in vitro with a Sedimentable Constituent of Normal Tissue Cells. I. Demonstration of the Phenomenon. II. Specificity of the Phenomenon: General Discussion.**—*J. exp. Med.* **76.** 543–556 & 557–578. **1633**

I. Complement fixation is shown to occur when the serum of normal adult rabbits is mixed with fresh saline extracts of rabbit tissues. The techniques used in the test and for the preparation of the reagents are described in detail. The phenomenon is due to the reaction between a specific natural antibody in such sera, and a constituent of normal tissue cells, which sediments when tissue extracts are centrifuged at high speeds. This antigen is present, and is almost identical, in many tissues, especially kidney and liver, and in all the small animal species so far examined. Tests used in examining its properties are given and they indicate that it may be a protein.

II. The antigen from normal tissues is distinguished from other sedimentable constituents of normal and neoplastic tissue cells. The present findings are discussed with regard to the possible mode of formation of the natural antibody, and the effect of this phenomenon on complement-fixation tests.—J. Keppie.

Heidelberger, M., Kabat, E. A., & Mayer, M. (1942). **A Further Study of the Cross Reaction between the Specific Polysaccharides of Types III and VIII Pneumococci in Horse Antisera.**—*J. exp. Med.* **75.** 35–47. **1634**

This is a continuation of earlier work on pneumococcus type III—type VIII cross-reactions. A quantitative study of the cross-reaction between type VIII specific polysaccharide and type III anti-pneumococcus horse serum, reveals a general similarity to the reaction between type III polysaccharide and type VIII anti-polysaccharide. Two-segment curves of the reaction, however, show distinct qualitative and quantitative differences in the course and character of the reciprocal reactions with respect to each segment. These differences can be interpreted in terms of the known chemical differences between the specific polysaccharides of the two types. Type III and type VIII polysaccharides have minimum molecular weights of 62,000 and 140,000 respectively. It is possible to fractionate type VIII antibody into three portions, characteristic of each segment of the cross-reaction curve. At least three different kinds of Type III and Type VIII anticarbohydrates can be identified.—Isobel W. Burton.

Kolmer, J. A., Bondi, A., Jr., & Rule, A. M. (1942). **Persistence of Antibodies One Year after Active Immunization of Human Beings with a Mixed Heat-Killed Vaccine of *B. typhosus*, *Br. abortus* and *Br. melitensis*.**—*J. infect. Dis.* **70.** 54–57. **1635**

The antibodies resulting from a course of three injections of heat-killed typhoid-brucella vaccine persisted satisfactorily in a group of human beings for one year. As regards *Br. abortus* the agglutinin titre almost uniformly fell from 1 : 320 to 1 : 80, and although the opsonin also decreased over the period, large amounts still persisted in 90%. The protective value of the sera against the experimental infection of mice with this organism increased in 36% of the cases and remained as formerly in 12%, while in the case of *Br. melitensis* only 60% maintained their earlier values. For *Salmonella typhi* it was shown that 68% of the H-agglutinin titres showed a fall, but all were still much above the pre-immunization values, whereas only 56% of the O-titres remained above the normal level. Again the protective value of the sera for mice increased in 52% of the cases and equalled its former efficacy in 28%. It is suggested that the use of such a mixed vaccine is worthy of a clinical trial in human medicine.—J. K.

Coons, A. H., Creech, H. J., Jones, R. N., & Berliner, E. (1942). **The Demonstration of Pneumococcal Antigen in Tissues by the Use of Fluorescent Antibody.**—*J. Immunol.* **45.** 159–170. **1636**

This investigation was initiated in an attempt to evolve a method whereby chemically labelled antibodies might be utilized as reagents for the detection and orientation of antigenic material in mammalian tissue. The preparation of fluorescin-4-isocyanate and methods for conjugating it through the ureide linkage with concentrated antipneumococcal-3 antibody solution are described. This fluorescin-carbamido-pneumococcal-3 antibody solution was yellow in colour with some green fluorescence in visible light and a brilliant bright green fluorescence in ultraviolet light, possessed the same agglutinin titre as the original serum, and imparted its fluorescence to agglutinated washed organisms. The tissues of mice infected with the homologous organism could be specifically stained in localized areas, particularly in the liver and spleen, with this antibody conjugate, indicating the presence of the homologous organism or its specific soluble substance. Incomplete data are presented which appear to suggest that the antigen-antibody reaction is reversible.—J. Lochiel McGirr.

Henry, J. P. (1942). **Quantitative Studies of the Photochemical Despeciation of Horse Serum. An Approach to the Problem of Intravenous Foreign Protein Therapy.**—*J. exp. Med.* **76.** 451–476. **1637**

The effect of light energy in reducing protein antigenicity without at the same time reducing molecular weight has been studied by three methods :– (1) by the use of quantitative anaphylactic studies in the g. pig *in vivo*, (2) by the use of the Dale uterine horn technique, and (3) by the injection of equal amounts of materials of known and unknown antigenicity into two series of rabbits and the titration to optimal proportion of the resultant precipitins. It is stated that by using these three methods and by applying them at various stages of any process employed to reduce antigenicity, a reasonable degree of accuracy may be attained. Accuracy would be further increased by using large numbers of animals to smooth out individual variations.

Normal horse serum was irradiated for periods of 3–4 days with visible or with ultra-violet light of known intensity and wavelength. Haematoporphyrin was added in some instances as a photosensitizer. The irradiated sera were unchanged in colour and over 90% of the original protein content remained precipitable by phosphotungstic acid. Fresh antigenicities of deviated specificity and of an activity of the order of 1/50, 1/1,000 and less than 1/20,000 that of normal horse serum were obtained. The residual content of material having the same antigenic specificity as normal horse serum was estimated as approximately equivalent in activity to dilutions of normal horse serum of 1 ml., 0·1 ml., and less than 0·01 ml. per litre respectively.—E. J. M. H.

Reifenstein, G. H., & Hilfinger, M. F., Jr. (1942). **Studies on Leukocytosis. III. Hourly Determinations of the Maturity of Neutrophils of Normal Rabbits.**—*Amer. J. Path.* **18.** 363–368. [For previous parts, see *V. B.* **12.** 52]. **1638**

Reifenstein, G. H., Ferguson, J. H., & Weiskotten, H. G. (1942). **Studies on Leukocytosis. IV. The Neutrophilic Maturity Following Intravenous Injection of Supernatant Fluid from a Sterile Exudate (Rabbit).**—*Ibid.* 369–379. **1639**

[Authors' summaries copied *verbatim*].

III. Variations of maturity of polymorphonuclear neutrophilic leukocytes (amphophils), expressed as a single figure, the weighted mean, are presented for 20 apparently normal rabbits, studied at successive hourly intervals during a 6-hour daily period.

Each rabbit seemed to have a characteristic degree of neutrophilic maturity on the day on which counting occurred. Regardless of this degree, neutrophilic

maturity was relatively constant during the successive hours of counting.

In these rabbits, with very rare exception, only cells of the neutrophilic series which were more mature than metamyelocytes (group I) were observed in the circulating blood.

IV. Some substance or substances, not sodium chloride, present in supernatant fluid fractions of sterile peritoneal exudates from rabbits, produced neutrophilic "left shifts" when injected intravenously into other rabbits. Following repeated injections of supernatant fluid, there was an apparent "summation" of these "left shifts".

These neutrophilic "left shifts" were effected by release of more immature neutrophils in greater numbers, probably from the bone marrow. In these experiments, metamyelocytes (group I neutrophils) were observed very rarely, and no cells more immature than metamyelocytes were found in the circulating blood.

See also absts. **1581** (immunity to TB.), **1592** (to bovine brucellosis), **1651**, **1654**, **1656** (to helminths).

PARASITES IN RELATION TO DISEASE [GENERAL]

OLSEN, O. W., & FENSTERMACHER, R. (1942). **Parasites of Moose in Northern Minnesota.**—*Amer. J. vet. Res.* **3.** 403–408. **1640**

The authors note three nematodes not previously reported from the moose in North America. They are *Trichuris* sp., *Oesophagostomum venulosum* and *Ascaris* sp. A table is given showing the location and incidence of the various parasites which have been recorded for the moose in Minnesota. The commonest arthropod is the tick, *Dermacentor albipictus*, while *Nematodirella longispiculata* and *Dictyocaulus viviparus* are the commonest nematodes. *Cysticercus tenuicollis* and hydatid cysts are the common cestodes and *Paramphistomum cervi* is the commonest trematode. The authors append a key for the field identification of the parasites known to occur in the North American moose.—T. E. GIBSON.

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

SOUTHERN RHODESIA. (1941). **Report of the Division of Entomology for the Year ending 31st December, 1940.** [JACK, R. W.] pp. 15. Items of veterinary interest pp. 5–10. [Mimeographed] [fcp]. **1641**

Tsetse-fly operations continued throughout the year and resulted in the continued retreat of the fly in the northern areas. Over 6,000 square miles were completely cleared by 1941, and the density of the fly was reduced to vanishing point over extensive areas. Several sporadic outbreaks of TRYPANOSOMIASIS occurred in cattle, but generally losses from the disease were slight.

Records are made of aural MYIASIS in sheep and skin myiasis of an elephant, both due to larvae of *Chrysomyia bezziana*, and of bots of *Platycobboldia loxodontis* in the stomach of an elephant.—D. D. O.

SOUTHERN RHODESIA. (1942). **Report of the Division of Entomology for the Year 1941.** [JACK, R. W.] pp. 19. [Typescript]. **1642**

This report deals, among other things, with the situation in Southern Rhodesia as regards locusts and insects of medical and veterinary interest, about half the report being devoted to the progress of tsetse-fly control. The maggot fly, *Chrysomyia bezziana*, is mentioned as a serious pest of cattle.

The measures being taken to protect areas cleared of tsetse-fly against re-invasion, reopening of such areas for grazing purposes, the planned extension of cleared areas, and the prevention of the advance of *Glossina morsitans* from Portuguese territory, are dealt with in detail. The principal methods of tsetse control in operation consist of game reduction, trapping of flies and control of traffic on roads.—U. F. RICHARDSON.

CASSAMAGNAGHI, A. (1942). Columbicola columbae en las palomas. [*C. columbae* **on Pigeons**].—*Bol. mens. Direcc. Ganad., Montevideo.* **26.** 295–296. **1643**

C. describes the pigeon louse, *Columbicola columbae*, which is a common parasite of pigeons in Uruguay.

—MILLER WATSON.

DEONIER, C. C. (1942). **Seasonal Abundance and Distribution of Certain Blowflies in Southern Arizona and Their Economic Importance.**—*J. econ. Ent.* **35.** 65–70. **1644**

The screwworm, *Cochliomyia americana*, which is the main cause of myiasis in Arizona, is dealt with only incidentally in this paper. Trapping data are given for *Cochliomyia*, *Phormia*, and *Lucilia* spp. together with temperatures, rainfalls, and other environmental factors in two ecological types of country—low-lying, cultivated, irrigated valleys and high-lying, uncultivated, unirrigated grazings, the latter, 2,000–3,000 feet higher, having lower mean temperatures and higher rainfalls. Optimum temperatures for *L. sericata* and *P. regina* are monthly means of 60°–70°F.; both species are rapidly reduced in numbers by monthly means above 70°F. *Phormia* is not restricted to sheep areas, as shown by the large population of *Phormia* recorded at one of the trapping stations where there were no sheep but only cattle and horses, rabbits, coyotes, and deer.

C. macellaria was the species found most frequently as a secondary invader in screwworm-infested wounds. This species appeared later in the spring than *Lucilia* and *Phormia*, but remained active throughout the summer and autumn, its optimum temperature range being monthly means of 70°–80°F.

In 120 cases of myiasis examined, *C. americana* accounted for 80, and was present in a further 25; *L. sericata* was involved in 26, of which seven were unmixed; *P. regina* occurred 16 times, of which four were unmixed; *C. macellaria* was found 15 times, two being simple infestations; *Sarcophaga* sp. accounted for one unmixed myiasis, and in seven cases the species involved was not determined.

In the absence of preventive measures, animals are treated only as they become infested. The high blowfly population of the irrigated districts could be reduced by the removal of carcasses which serve as host material. *Phormia* and *Lucilia* influence the shearing date, since failure to shear sheep before these flies become abundant results in as high as 30% infestation.—A. MILNE.

*KOMÁREK, J. (1939). Können die Fleischfliegen eine Myiasis intestinalis verursachen? [**Failure of Flesh-Fly Larvae to Cause Intestinal Myiasis in a Dog**].—*Verhandl. VII. int. Kongr. Ent., 1939.* pp. 1604–1607. [Abst. in *Biol. Abstr.* Sect. F. **16.** No. 8. 39, copied *verbatim.* Signed: A. G. RICHARDS, Jr.] **1645**

Larvae of *Calliphora vomitoria*, *Sarcophaga carnaria*, *Lucilia caesar* and *Musca domestica* are easily killed by suffocation and by an acid sol. of pepsin at 37°C. Larvae placed in a dog's esophagus and then swallowed were all killed, as shown by dead larvae found on operation 6 hours after swallowing. The author denies that these

fly larvae can cause intestinal myiasis. Discussion by others both concurring and dissenting.

STAGE, H. H. (1942). **Dog Fly Control in Northwest Florida.**—*Proc. ent. Soc. Wash.* **44.** No. 4. 74. **1646**

In north-west Florida, *Stomoxys calcitrans*, locally known as the "dog fly", bred enormously in windrows [heaps of fermenting aquatic vegetation blown up by the wind] on the shores of bayous [inlets] and backwaters reaching inland from coastal areas. The adult fly caused important cattle losses. Control was by spraying the windrows, from barges, with "creosote oil" diluted in a light Diesel fuel oil; 700 miles of shoreline were treated with about 270 gal. per mile. Inland areas have frequently experienced plagues resulting from the flies' breeding in decaying trash left in peanut fields; in this case, disposal of the trash is the remedy.—A. MILNE.

JACK, R. W. (1942). **The Life Economy of a Tsetse Fly.**—*Proc. Rhod. sci. Ass.* **39.** 43–60. **1647**

It is pointed out that the tsetse fly's method of reproduction is slow as compared with other insects, and that in order to produce sufficient progeny to ensure continuance of the species, the female tsetse must live a considerable time and take a great deal of food. At higher temperatures the life of the female is shorter and the period of gestation reduced. It is thought that 12 young would be an exceptionally large family for one female.

Tsetse flies are dependent on the blood of vertebrate animals both for food and moisture, since they do not drink water. A reserve of water is stored in the fat bodies. Loss of water is the most serious risk to which tsetse flies are exposed.

Under moderately hot, dry conditions *Glossina morsitans* feeds about every third day. Feeding as infrequently as every fifth day will maintain health, but inhibits reproduction.

Tsetse have another weakness in that they are unusually susceptible to heat, and none will survive an exposure of three hours to a temperature of 104°F. The distribution of *G. morsitans* does not, however, appear to be limited anywhere by excessive heat, but cool conditions limit distribution, and the fly does not occur at elevations over 4,000 feet.

Differences in the behaviour of various species of tsetse are recapitulated, and it is pointed out that *G. morsitans* has a marked negative reaction to light. At high temperatures flies will leave a non-lethal temperature in a light part of a cage for a lethal temperature in a shaded section. In nature this reaction is manifested as a positive attraction to patches of darkness, and probably explains the attraction to traps.

Scent plays an important part in attracting tsetse to their hosts, but sight is probably more important, and movement is also a factor. Hunger induces greater activity and a more positive reaction to light, so that hungry flies seek open glades.

In *G. morsitans* all the reactions of the flies are adapted to their feeding on large mammals, and it is doubtful if man alone would be an adequate host for a population of *G. morsitans*.

It is considered that such species as *G. morsitans* are very delicately poised in the balance of nature, and after any important change in locality, such as depletion of game, the flies may fail to maintain themselves and gradually die out.—U. F. RICHARDSON.

MAIL, G. A. (1942). **Lethal Temperatures for *Dermacentor andersoni* Stiles and Other Ticks in British Columbia.**—*J. econ. Ent.* **35.** 562–564. **1648**

D. andersoni, the most important tick in western Canada, is found in south-western Saskatchewan, southern Alberta, and southern British Columbia east of the coast range.

Freezing was found to be lethal for the ticks in all stages. The freezing points of *D. andersoni* are −28°C. for eggs, −23°C. for larvae, −10° to −14°C. for unfed ticks, and −5° to −7°C. for engorged ticks. The lethal high temperature for unfed ticks is 45° to 46·5°C.

Unfed *Ixodes californicus* freeze at −12·5°C. and *I. texanus* about −23°C. When engorged both species freeze near −7°C.

Engorged *Haemaphysalis cinnabarina* freeze at −11·3°C.—W. MOORE.

LUCAS, G. C. (1942). Pseroptes ovis (Hering) Gervais. Contribución al estudio de su ciclo evolutivo. [**Life Cycle of *Psoroptes ovis***].—*Rev. Med. vet., B. Aires.* **24.** 406–426. **1649**

L. studied the life-cycle of *Psoroptes ovis* by a method similar to those employed by BEDFORD in South Africa and by DOWNING [*V. B.* **7.** 122 (I)]. He found that the complete cycle (from egg to egg) takes a minimum time of ten days. This agrees with the findings in Britain and South Africa.—MILLER WATSON.

See also absts. **1580** (mange in cattle), **1805**, **1806** (cattle poisoning by saw-fly), **1606** (vectors of *Trypanosoma cruzi*), **1614** (of avian malaria), **1763–1767** (insecticides).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

*FINZI, G. (1941). Rilievi anatomo-istologici sulla distomatosi epatica del coniglio. [**Pathology of Liver Fluke Infestation in Rabbits**].—*Profilassi.* **14.** 1–6. [Abst. from abst. in *Jber. Vet.-Med.* **69.** 462]. **1650**

Liver changes in rabbits resemble those of cattle and sheep, except that in place of bile duct stenosis and thickening of the bile duct wall there is dilatation of the wall resulting in cyst formation and atrophy of the wall.

ITOIZ, O. A. (1942). Equinococosis primitiva experimental. Inmunidad y alergía en la hidatidosis; su expresión anatómica. [**Experimental Echinococcosis. Immunity and Allergy**].—*Bol. Inst. Clin. quir. B. Aires.* **18.** No. 144. 49–109. **1651**

The author produced hydatidosis in five young pigs by feeding eggs of *Echinococcus granulosus*. Studies were made of the development of the cysts by means of liver biopsies made at 24, 48, and 72 hours and nine and 27 days from the time of dosage. P.M. examinations were made up to 11 months after dosage. As a desensitization measure, one pig was given injections of hydatid fluid during the development of the cysts.

Histological studies of cyst walls showed that the adventitious coat was undergoing some degree of necrosis except in the case of cysts from the pig given the desensitizing injection. In these the adventitious coat was proliferating.

Immunity, allergy, and the possibility of preventive inoculation are discussed.—MILLER WATSON.

TOMITA, S. (1939). [**On the Species of *Strongyloides* in Formosan Pigs and Monkeys**].—*Taiwan Igakki Zasshi.* **38.** 1613–1624. [In Japanese: English summary]. **1652**

T. gives a detailed morphological description of *Strongyloides* spp., probably *S. papillosus* and *S. fülleborni*, infecting Formosan pigs and monkeys. The two species seem to be distinct. By infection tests with larvae of both species he showed that larvae of pig *Strongyloides* easily infect rabbits. Young rabbits and

pigs, however, are refractory to infection by the larvae of monkey *Strongyloides*.—E. R. PARISER.

I. STOWENS, D. (1942). **The Effect of Ultraviolet Irradiation on *Trichinella spiralis*.**—*Amer. J. Hyg.* **36.** 264–268. **1653**

II. LEVIN, A. J., & EVANS, T. C. (1942). **The Use of Roentgen Radiation in Locating an Origin of Host Resistance to *Trichinella spiralis* Infections.**—*J. Parasit.* **28.** 477–483. **1654**

I. Larvae of *T. spiralis*, obtained by digesting infected tissues, were suspended in bacteriological nutrient broth plus 20% gelatin (to maintain fairly constant suspension). Doses of 500 larvae were exposed to ultra-violet light in a quartz cup for various periods and then administered to groups of albino mice. All larvae were motile at the time of administration. After 3–5 days, fewer adult worms were recovered from the intestines of the test mice than from the controls fed unirradiated larvae, varying from 14·8% less for the 5-min. exposure group to 99·5% less for the 2-hour exposure group. Four weeks after infection, the numbers of larvae recovered by digestion of the carcasses varied from 58% less than for the controls for the 5-min. exposure group to none for the hour and 2-hour groups.

It is concluded that ultra-violet irradiation impairs the ability of *T. spiralis* to establish itself within the intestines of mice and lowers the amount of subsequent muscle invasion, presumably by interfering with the reproductivity of the adult worms.

II. It was found that certain doses of X-rays administered to larvae of *T. spiralis* did not significantly affect the proportion of adults able to establish themselves in the intestine of rats, but reduced almost to nil the number of larvae subsequently invading the muscles. Doses of approximately 4,000 larvae were irradiated with the given amount of X-rays and administered to previously uninfected young rats, while similar doses of unirradiated larvae were given to a control group of similar rats. Groups of the rats were later given as a test dose either 2,500 or 10,000 unirradiated larvae at intervals of two, three, or four weeks after the original infection, two of the control animals being included in each group. Two months after the test dose all the rats were killed. Only very few larvae were recovered from the muscles of the animals given irradiated larvae, indicating that intestinal infection without subsequent muscle invasion had produced a strong resistance to reinfection.

It is concluded that the origin of host resistance to *T. spiralis* lies in the intestine. It is suggested that the method may be useful in elucidating other problems of host resistance.—D. G. GILMOUR.

WETZEL, R. (1942). Ueber die Entwicklungsdauer der Palisadenwürmer im Körper des Pferdes und ihre praktische Auswertung. **[Period of Development of Horse Strongyles in the Body of the Host and its Practical Application].**—*Dtsch. tierärztl. Wschr.* **50.** 443–444. **1655**

A four-month-old foal was given by stomach tube 100 infective larvae of *Strongylus vulgaris* and 150 of *S. equinus*. By faecal counts and larval culture it was shown that eggs of *S. vulgaris* were first passed 6½ months after infection. *S. equinus* required over eight months to reach maturity. The small strongyles (trichonemas) appear to require only 6–12 weeks for development. Eggs passed in the dung of the unweaned foal within six weeks of infection were undeveloped eggs picked up and passing right through the intestine.

Since most of the damage in equine strongylosis is done by the migrating larvae and since anthelmintics will only remove the mature worms from the bowel, hygienic precautions play an important part in control. W. suggests a first treatment of the foal at 3–4 months, the animal then being put out to grass or the pasture changed. A second treatment at about eight months is designed to remove the larger strongyles before many eggs are passed and a further change of pasture is then desirable. A third treatment at 12–15 months is recommended to be carried out just before putting the animal out to grass in the spring.—H. E. HARBOUR.

TALIAFERRO, W. H., & SARLES, M. P. (1942). **The Histopathology of the Skin, Lungs and Intestine of Rats during Passive Immunity to *Nippostrongylus muris*.**—*J. infect. Dis.* **71.** 69–82. **1656**

Bartonella-free rats were passively immunized against *N. muris* by intraperitoneal injection of immune serum at varying intervals before they were infected by the application of infective larvae to the skin. They were killed four hours to 16 days after infection, and various tissues were examined histologically.

Larvae in the skin showed evidence of having fed during the first 12 hours and at 16 hours their intestines contained the "immune precipitate" described by the authors in an earlier paper [see *V. B.* **11.** 235]. Inflammatory changes in the skin began at 16 hours, were most pronounced 2½ days after infection, and then subsided. No larvae were found in the skin after three days.

Larvae were found in the lungs chiefly during the period 20 hours to 4 days after infection. Many of them appeared to have developed normally, although some contained "immune precipitate". Inflammatory changes in the lung were slight one day after infection and reached a maximum two days after infection. In local areas containing larvae, cellular accumulations reached a maximum several days later but subsided rapidly when the larvae migrated.

The majority of the larvae reached the intestine 2–4 days after infection, the passive immunity being ineffective in delaying the migration of many larvae, and only temporarily delaying others. Most of the worms, however, were stunted or contained "immune precipitate" and tended to occupy the lumen of the intestine and not the spaces between the villi. The inflammatory changes in the intestine began about two days after infection, reached a maximum six days later, and then gradually subsided, although they were still evident 16 days after infection, when observations ceased.

These findings are compared with those previously recorded for infection of unimmunized and actively immune rats. The differences observed between the reactions of actively and passively immune rats were quantitative rather than qualitative. The reactions in passively immune rats were, in the main, intermediate between those in unimmunized rats and those in actively immune rats. In all cases a superimposed acquired immunity came into play about one week after infection. The authors consider that the findings add further evidence of the primary role of antibodies in immunity to *N. muris*.—T. E. GIBSON.

KRUPSKI, A., & UEHLINGER, E. (1942). Beitrag zur Frage des Vorkommens der Lungenwurmkrankheit des Rindes in der Schweiz nebst klinischen, pathologisch-anatomischen und histologischen Befunden. (Zugleich Beitrag zur Frage des Vorkommens der Osteoporose). **[The Question of Lungworm Disease in Cattle in Switzerland; with Clinical, Pathological and Histological Findings. (Incidence of Osteoporosis)].**—*Schweiz. Arch. Tierheilk.* **84.** 253–262 & 291–300. **1657**

The authors note that *Dictyocaulus viviparus* infestation of cattle is widespread in Switzerland. They describe in detail 32 cases. Clinical symptoms, pathology, differential diagnosis, and control by prevention are discussed.

Several cases of osteoporosis were noted in the course of these observations.—H. E. HARBOUR.

*LEYHE, K. (1941). Filariosen bei Haus- und Tropentieren. **[Filariasis in Domestic and Tropical Animals].** —*Inaug. Diss., Hanover.* [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **50.** 112]. **1658**

L.'s aim was to compare and describe the known species of filariid worms and to give more information about those which are less well known. Their importance in veterinary medicine is stressed.

According to their site, the filariids are divided into three groups :– (1) parasites of the vascular system (*Dirofilaria immitis, Elaeophora poeli*) ; (2) parasites of the connective tissues and skin (*Parafilaria multipapillosa, Stephanofilaria dedoesi, S. stilesi, S. assamensis, S. kaeli, Dirofilaria repens, Dracunculus medinensis, Onchocerca flexuosa, O. reticulata*), and (3) parasites of the serous cavities (*Setaria equina, S. labiatopapillosa*).—H. D. C.

See also absts. **1801** (livestock parasites in Canada), **1640** (moose parasites), **1668** (liver fluke in cattle), **1809** (introduction to nematology), **1736**, **1768**, **1769** (anthelmintics).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

*KUBINSKY, E., & JIRKOVSZKY, M. (1941). **[Fibroneuroma in Cattle].**—*Közl. Összehas. élet- és kórtan Köréből.* **30.** 59. [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **50.** 170]. **1659**

A pathological study of widespread neoplasia of peripheral nerves in a cow, affecting chiefly the nerves of the shoulder, thigh, brachial plexus, neck, ribs, and parts of the skin. The nerves were thickened and contained numerous nodules. Two kinds of neoplasm were found, *viz*, neurofibroma containing nerve fibres and neurinoma in which no nerve fibres were to be seen.

BONSER, G. M. (1943). **Epithelial Tumours of the Bladder in Dogs Induced by Pure β-Napthylamine.** —*J. Path. Bact.* **55.** 1–6. **1660**

Large oral doses of β-naphthylamine (initially 100 mg. rising to 700 mg. daily) were given over long periods to three litter-mate Airedale dogs and one bitch which at the commencement were half-grown and of medium size. One dog died after 12 months, P.M. examination revealing what is described as a generalized Hodgkin-like lesion. Its bladder contained 15 small raised areas, each 1–8 mm. in diameter and histologically resembling a subepithelial Hodgkin's nodule. The bladder epithelium had been almost entirely shed. The bitch and a second dog died after 44 and 50 months respectively, death in each case being preceded by continuous haematuria over a period of some months. Papillomatous growths were present in the bladder. Apart from pneumonia and hyperplastic lymphoid tissue in the spleen of the dog, there were no other lesions. The third dog survived five years, when it developed two duodenal ulcers and was killed while in distress. P.M. examination again revealed papillomatosis of the bladder and a single nodule of hyperplastic lymphoid tissue in the spleen.

In no case was there metastasis, or any evidence of tumour formation in the ureters, renal pelvis, or urethra. A detailed description is given of the bladder lesions, which are held to form a graded series from simple hyperplasia to anaplastic carcinoma with infiltration of smooth muscle and permeation of lymphatic vessels. The β-naphthylamine was specially purified by one of the large drug-houses.—ALASTAIR N. WORDEN.

KOLLER, P. C. (1943). **Origin of Malignanut Tmour Cells.**—*Nature, Lond.* **151.** 244–246. **1661**

After discussing the various types of cytological abnormalities found in tumour cells, K. points out that the changes indicate that there is in the tumour cell an increased production of nucleic acid, its synthesis being regarded as the function of the heterochromatic portion of the chromosomes. Such an increase should result in progressive shortening of the resting stage between divisions, and increase the possibility of chromosome abnormalities. The various types of division seen, and the neucleolar variations are discussed in the light of this interpretation. The heterochromatin change may be the result of a somatic gene mutation, but as yet no evidence proving this has been found.—J. G. CARR.

CARR, J. G. (1942). **The Absence of a Seasonal Influence upon the Rous No. 1 Sarcoma in Young Chicks.**—*Brit. J. exp. Path.* **23.** 339–342. **1662**

A total of 971 healthy Brown Leghorn chicks, 6–9 weeks of age, was inoculated with cell-free Rous sarcoma material. It was found that, over a period of four years, there was no definite seasonal variation in the chicks' susceptibility to the Rous No. 1 sarcoma, but that a seasonal variation might perhaps be produced by infestation, as evidenced in this case by red mite infestation.—ANTHONY BUXTON.

ZAHL, P. A., & HUTNER, S. H. (1942). **Action of Bacterial Toxins on Tumors. II. Effect of Sulfanilamide on Toxin-Induced Hemorrhage.**—*Proc. Soc. exp. Biol., N.Y.* **51.** 285–287. [For part I, see *V. B.* **13.** 176]. **1663**

Sulphanilamide can abolish the haemorrhagic effect which salmonella endotoxin produces in sarcomas in mice, provided that the dose of endotoxin given is not too large. It is suggested that the haemorrhagic factor may be identical with the lethal factor present in salmonella endotoxin, against which the mouse is also protected, within certain limits, by sulphanilamide.

—J. M. ROBSON.

POLLARD, M., HALL, W. J., & EICHHORN, A. (1943). **Serological Studies on the Avian Leukosis Complex. Preliminary Report on Complement Fixation.**—*Poult. Sci.* **22.** 20–24. **1664**

Chicken serum was found to be of no value for use in complement-fixation tests owing to its anticomplementary property. Turkey and guinea fowl sera were suitable.

Whole blood of normal chicks, chick embryos, and guinea fowls inoculated into turkeys and guinea fowls failed to induce complement-fixing antibodies. Whole blood and tissues of leucotic chicks, chick embryos, and turkey embryos inoculated into adult turkeys induced complement-fixing antibodies. Two strains of leucosis tested were serologically indistinguishable. The customary inactivation of test antisera by heating was not carried out since heating at 56°C. for 20 min. destroyed the complement-fixing property.

Whole blood and liver-spleen emulsions of fowls affected with visceral lymphomatosis (" big liver disease ") failed to induce antibodies against leucosis antigen.

Blood from a single case of neurolymphomatosis injected into a turkey stimulated the production of antibodies which fixed complement in the presence of the two leucosis antigens tested.—F. D. ASPLIN.

COTTRAL, G. E. (1942). **Vinylite-Resin-Corrosion Preparations in the Study of the Avian Leucosis Complex.**—*Amer. J. vet. Res.* **3.** 227–234. **1665**

Techniques for the preparation of corrosion casts of the vascular system of fowls are described. The method involves complete removal of the blood by flushing the vessels through with water, and replacement of the water with acetone, excess acetone being removed by injection of air. The introduction of vinylite resin of different colours served to differentiate venous and arterial systems. After allowing the resin to solidify, casts were freed from tissue by immersion in commercial hydrochloric acid for three days. Modifications are described in which the skeletal parts are retained in position, and in which the soft tissues surrounding the casts are retained in a transparent form. This technique has been employed in a study of the vascular changes occurring in fowl leucosis.

In general the arrangement of the vessels of the livers of fowls with leucosis was similar to the normal form, but the vessels were larger and further apart in pathological specimens. In cases showing large focal lesions the arrangement was erratic.—F. D. ASPLIN.

See also absts. **1771** (avian leucosis), **1717** (fibroids and hormones), **1702** (potassium in cancerous tissues), **1679** (dietary destruction of butter yellow).

DISEASES, GENERAL

*DEMSKI, G. (1941). Ueber den Gehalt des Serums bzw. Plasmas an Albumin, Globulin und Fibrin bei gesunden und kranken Pferden und Rindern. [**Serum and Plasma Albumin, Globulin and Fibrin in Healthy and Sick Horses and Cattle**].—*Inaug. Diss., Berlin.* pp. 31. [Abst. from abst. in *Jber. Vet.-Med.* **69.** 340]. **1666**

The total protein, albumin, globulin, and fibrinogen content of healthy horse plasma was 8·32%, 4·22%, 3·76%, and 0·34% respectively; the corresponding figures for cattle were 9·47%, 4·69%, 4·22%, and 0·56%, respectively. In all illnesses the albumin content is decreased and that of the others increased. Catarrh of the upper respiratory tract produced the greatest increase in the fibrin fraction, total protein increasing only slightly. The values lie in the normal range in cases of colic. [See also abst. no. **1697**.]—J. G. CARR.

*DIETRICHS, E. (1941). Vergleichende Untersuchungen über die Sublimatprobe und den Kaliumgehalt des Blutes von kranken Pferden. [**Comparative Sublimate Tests and Blood Potassium Assays in Sick Horses**].—*Inaug. Diss., Hanover.* [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **50.** 271]. **1667**

D. determined the blood K, serum protein, and the sublimate reaction on 55 horses with internal disorders and in five surgical cases. In some cases the K was within the normal limits, but was decreased when there were marked sublimate reactions. In four cases with a low albumin : globulin ratio, the K content was low. In three cases with similar findings the red cell count was below normal, infectious anaemia being suspected. In three cases with a high K content the sublimate reaction was negative, and was weakly positive in one case. D. concludes that specific alterations in the K content of the serum are not found in disease conditions.—J. G. CARR.

*SCHMIDT, J. (1942). Schlachtbeobachtungen an Rindern und die Beschaffenheit des Rinderkörpers verschiedener Schlachtwertklassen. [**Observations on Slaughter Cattle**].—*Züchtungskunde.* **17.** 9–26. [Abst. from abst. in *Z. Fleisch- u. Milchhyg.* **52.** 138–140]. **1668**

Data on quality and condition as well as observations on disease were collected from 448 slaughtered cattle of various breeds. The age, size, etc., of each animal were recorded and the separate quarters and organs of each animal were weighed and examined.
—E. R. PARISER.

GREIG, J. R. (1942). **Grass Sickness in Horses. A Review of the Disease, with Particular Reference to the Nature of the Causal Agent.**—*Trans. Highl. agric. Soc. Scot.* **54.** 3–27. **1669**

In this review by the director of the Scottish veterinary research institute at which the investigation of "grass sickness" has been pursued for many years, the disease is described, together with the many experiments which have produced nothing but negative evidence on the aetiological problem, which remains quite obscure. Attempts to incriminate poisonous plants, nutritional deficiency, anaphylaxis, enterotoxaemia, and any live infective agent have all failed.
—J. E.

GRATH. (1942). Warum müssen Kühe vor dem Kalben trockengestellt werden? [**Why Must Cows be Given a Dry Period before Calving?**]—*Dtsch. landw. Tierz.* **46.** 7–8. [Abst. from abst. in *Nutr. Abstr. Rev.* **12.** 324]. **1670**

It appears from the abstract that farmers in Germany have been forced to keep their cows in milk for as long as possible to get maximum production, even in times of diminishing food supply for cattle. The result is an undermining of health and the production of weak calves. It is therefore necessary to abandon the above practice and to allow time for recovery in bodily resources.

NELSON, J. B. (1942). **Reciprocal Transmission Tests with Infectious Catarrh of Chickens, Mice, and Rats.**—*J. exp. Med.* **76.** 253–262. **1671**

Infectious catarrh of chickens was not transmissible to mice or rats, when the exudate was instilled into the nose or injected into the foot pads.

The infectious catarrhs of the mouse and rat were reciprocally transmissible by nasal instillation of exudate or culture of the respective coccobacilliform bodies and by direct contact. Foot pad infection with exudates and cultures produced only arthritis.

In small-scale experiments, the infectious catarrh of mice could not be transmitted to chickens by nasal instillation of the exudate. In chickens inoculated similarly with the exudate of rat catarrh a local reaction developed, but the disease was maintained for only two passages.—M. H. KYAW.

PAPPENHEIMER, A. M., & SLANETZ, C. A. (1942). **A Generalized Visceral Disease of Guinea Pigs, Associated with Intranuclear Inclusions.**—*J. exp. Med.* **76.** 299–306. **1672**

A description of a spontaneous disease in two g. pigs, the symptoms consisting of a gradual loss in weight, lethargy, and dullness of the eyes.

The lesions found P.M. consisted of areas of consolidation in the lungs, areas of necrosis in the liver, and enlargement of the spleen and kidneys. Microscopically, epithelioid and mononuclear cells and some giant cells, all showing characteristic eosinophilic inclusion bodies in their nuclei, were demonstrated in all the visceral organs and in the blood.

Bacteriological examinations proved negative, and attempts at transmission of the disease to g. pigs were not satisfactory.

There is a discussion of the possible relation of this

disease to the salivary gland virus infection in g. pigs, although the authors believe them to be different diseases.—M. H. Kyaw.

*Neefs, E. (1942). La cirrhose hépatique chez le cheval. **[Hepatic Cirrhosis in the Horse].**—*Ann. Méd. vét.* p. 107. [Abst. from abst. in *Skand. VetTidskr.* **32.** 567 and 579]. **1673**

Description of ten cases of liver cirrhosis in horses, of clinical interest. No new light is thrown on specific aetiology.

Loomis, D., & Jett-Jackson, C. E. (1942). **Plastic Studies in Abnormal Renal Architecture. VI. An Investigation of the Circulation in Infarcts of the Kidney.**—*Arch. Path.* **33.** 735–769. [For part V, see *V. B.* **11.** 308]. **1674**

Perfusion and dissection of rats' kidneys at times varying from 1 min. to one year after experimental occlusion of the posterior branch of the renal artery have produced conceptions which are at variance with the generally accepted views of the vascular changes in areas of renal infarction.

The common tenet of re-vascularization is found to be incorrect. Rather is there adaptation, remodelling, and simplification of the pre-existing intertubular capillary network. Complete ischaemia does not follow the destruction. From the earliest stages the main branches of the occluded artery and some of the glomeruli are supplied with blood through capillary connexions between efferent arterioles of the anterior and posterior divisions of the renal artery. After two weeks, as a result of necrosis or fibrosis in glomeruli, abnormal vascular connexions—aglomerular branches of interlobular arteries and arterine rectae verae—appear in the zone of partial necrosis.

Fibroblastic proliferation is relatively insignificant and is confined to the walls of arteries. The resulting scar, which in ordinary histological preparations appears to be poorly vascularized, is in fact composed almost entirely of very densely crowded delicate vessels: when collapsed, they appear as solid tissue.—J. W. Whittick.

Blumer, G. (1942). **A Note on the Relationship between Jaundice in Pigs and Jaundice in Human Beings.**—*J. Mt Sinai Hosp. N.Y.* **8.** 418–421. **1675**

An attempt is made to incriminate "infected pork" as a cause of non-spirochaetal infectious hepatitis in man. Two women who lunched together on hot roast pork sandwiches, canned green peas and tea both developed the clinical picture of infectious hepatitis within two days, recovery occupying about three weeks in each case. B., who suggests that the pork was the only probable source of infection, recalls the work of Andersen [*V. B.* **8.** 597.] and of Andersen & Tulinius [*V. B.* **12.** 293.] who believed that infectious jaundice in Denmark could be transmitted from pigs to man, and suggests that the epidemiology of an American outbreak with which he was connected, simulated that described in Danish outbreaks.—Alastair N. Worden.

Bywaters, E. G. L., & Dible, J. H. (1943). **Acute Paralytic Myohaemoglobinuria in Man.**—*J. Path. Bact.* **55.** 7–15. **1676**

A résumé is given of seven published cases of human spontaneous myohaemoglobinuria, resembling "azoturia" in equines, and what is believed to be an eighth case is described in a 24-year-old man who was admitted to hospital with sore throat and generalized stiffness. Previous history included exhaustion and the passing of very dark urine after hard exercise. Haemolytic streptococci were recovered from a throat swab and after seven days of somewhat fluctuating but severe symptoms, believed to be due to acute nephritis, the patient collapsed and died. The P.M. findings included slight general subcutaneous oedema, evidence of acute focal gastritis, pulmonary emphysema and renal lesions identical in every way with those found in the "crush syndrome". The skeletal muscles appeared normal to the naked eye, but histological examination of the pectoral muscles revealed a marked patchy loss of pigment in many fibres, which showed a tendency to fragmentation, and changes which otherwise resembled those previously recorded in myohaemoglobinuria.

As a differential diagnosis, acute porphyria is discussed, and it is suggested that in further human cases, porphyrin metabolism might be investigated.

The connexion between the human and equine syndromes is stressed.—Alastair N. Worden.

Green-Armytage, V. B. (1943). **Discussion on New Developments in the Investigation and Treatment of Sterility.**—*Proc. R. Soc. Med.* **36.** 105–112. **1677**

From observations on newly married women, some of whom had immature genital organs, it appeared that sexual maturity was gained as a result of normal copulation and that whole semen contains a hormone which has this effect. In an experiment to test this theory, immature female rats were injected with semen and a rapid and significant increase in development of the genital tract resulted.

[This work postulates a secondary or preparatory role of normal copulation, namely the ripening of underdeveloped female genitalia, and, if the facts are established, is important in relation to artificial insemination, as, when this is practised, seminal hormone is absent or at least too deficient in amount to have the above effect. It may follow that artificial insemination is contraindicated in some virgin animals.]—J. E.

Mackie, T. J. (1942). **The Problem of Air-borne Infection.**—*Edinb. med. J.* **49.** 607–627. **1678**

A review on the problem of air-borne infection. Distinction is drawn between the possibilities of bacteria surviving and retaining their virulence in dust, in droplets, or in "droplet nuclei". The latter are fine droplets which have failed to settle but have evaporated, leaving nuclei of dried material which may float in the air for days. It is suggested that a fine spray of hypochlorite solution is the most practical way of reducing the total bacterial count of air. Much of the work on the problem of air-borne infection has been concerned with haemolytic streptococci and the question arises whether the streptococcal content of air may serve as an index of purity in the way that *Bacterium coli* does for water supplies.—D. L. Robarts.

See also absts. **1770** (eczema in horses), **1810** (equine practice), **1799** (poultry diseases), **1772** (haemorrhage), **1701** (blood pH in disease).

NUTRITIONAL AND METABOLIC DISORDERS

György, P., Tomarelli, R., Ostergard, R. P., & Brown, J. B. (1942). **Unsaturated Fatty Acids in the Dietary Destruction of *N,N*-Dimethylaminoazobenzene (Butter Yellow) and in the Production of Anemia in Rats.**—*J. exp. Med.* **76.** 413–420. **1679**

Butter yellow caused malignant hepatoma in rats when fed in diets containing either rice (polished or unpolished), "crisco" (a hydrogenated fat), or butter fat, but not when fed in diets containing crude or purified linoleic acid, and to a less extent purified preparations of arachidonic and oleic acids. These acids decolourized butter yellow in the presence of air *in vitro*, with accompanying lowering of their iodine number (degree of unsaturation). It is concluded that

these unsaturated fatty acids destroy butter yellow in the diet and in the intestine, perhaps by the formation of peroxides, while rice acts as an antioxidant. Little destruction occurs in the diets containing "crisco" or butter fat since these fats contain a low proportion of unsaturated fatty acids.

Feeding of crude linoleic acid with or without butter yellow led to loss of weight, progressive secondary anaemia, leucopenia, and infestation with lice. These effects, which it is assumed are caused by toxic oxidative by-products of linoleic acid, were prevented by the administration of yeast.—D. G. GILMOUR.

MITCHELL, H. S., GOLDFADEN, M. F., & HADRO, G. J. (1940). **Minerals in Nutrition. IV. The Effect of Kelp and Mineral Supplements on Atherosclerosis in Rabbits induced by Feeding Cholesterol.**—*Bull. Mass. agric. Exp. Sta.* No. 374. pp. 23–29. **1680**

Administration of potassium iodide supplying 25 mg. of iodine per day to rabbits raised the level of blood cholesterol and increased the severity of atherosclerosis induced by feeding cholesterol, but kelp at a level of 17% of the ration and supplying the same amount of iodine tended to decrease the severity of the aortic damage. In further experiments with rations containing kelp, kelp ash, and a synthetic salt mixture resembling the inorganic constituents of kelp, it was found that kelp ash gave no protection against cholesterol injury although there was an apparent tendency for the salt mixture to do so. It is concluded that some inorganic factors in kelp in addition to iodine are essential for the protection of rabbits against cholesterol-induced atherosclerosis.—W. R. MUIR.

BOYER, P. D., SHAW, J. H., & PHILLIPS, P. H. (1942). **Studies on Manganese Deficiency in the Rat.**—*J. biol. Chem.* **143.** 417–425. **1681**

A marked delay (89 days) occurred in the opening of the vaginal orifices of female rats on Mn-deficient diets and their oestral cycles (vaginal smear technique) were either irregular or absent. In the male rat, Mn deficiency caused testicular degeneration and complete sterility due to lack of spermatozoa. Affected rats of both sexes would not mate with normal animals. Growth was retarded in both males and females on Mn-deficient rations. Food consumption was about 20% less and efficiency of food utilization was also depressed. Diarrhoea and coprophagy were common among affected animals, but they remained active and showed no impairment of gait.

No histological abnormalities were detected in the adrenals, kidney, pituitary, and thyroid of the Mn-deficient rat; vacuolar degeneration was noted in the livers of four out of six, but a similar condition was noted in one of six controls. No bone abnormalities were detected, in contrast to the observations of BARNES *et al.* (1941) on two younger rats. Mn deficiency did not reduce the ascorbic acid content of the body tissues and administration of ascorbic acid did not stimulate the growth of affected rats. A reduced concentration of arginase was found in the livers of Mn-deficient rats.

A special feature of these experiments was the precaution taken to obtain experimental animals with very low reserves of Mn.—W. R. MUIR.

KNOX, J. H., BENNER, J. W., & WATKINS, W. E. (1941). **Seasonal Calcium and Phosphorus Requirements of Range Cattle, as Shown by Blood Analyses.**—*Bull. N. Mex. agric. Exp. Sta.* No. 282. pp. 28. **1682**

Analyses of the blood of cattle on P-poor range pasture were made at regular monthly intervals over a period of 3½ years with the twofold purpose of determining, firstly, the degree of correlation between the levels of Ca and inorganic P in the plasma and the amounts of these elements in the herbage consumed, and secondly, whether such analyses can provide a means of detecting deficiencies of these elements in the herbage. In accordance with the results of previous workers, plasma inorganic P was found to be closely correlated with P intake, whereas plasma Ca is an unreliable index of the Ca content of the ration. A correlation of $0{\cdot}6102 \pm 0{\cdot}0646$ was found between plasma inorganic P and the P content of the herbage. The authors believe this correlation to be high in view of the inherent difficulties of obtaining samples representative of the herbage consumed. (The sampling technique is described.) They consider that determinations of plasma inorganic P can be a useful guide to the adequacy of the P intake, particularly where accurate sampling of the pasture herbage is difficult, but the warning is given that, even among cattle on the same pasture, individuality, age, and stage of pregnancy or lactation are factors responsible for variations in the levels of blood P. It is therefore recommended that at least eight and preferably 10 or 12 cattle of each major class on the range be selected for blood sampling.

Comparative observations were made on two groups of cattle, each including breeding cows and yearling steers, in order to study the effect of a supplement of dicalcium phosphate (mixed with salt), on the blood picture, live weight increase, and breeding performance. The intake of P from this source never exceeded 3 g. per day and, although the average plasma inorganic P was above that of control animals, it still remained low and exceeded 4 mg. per 100 ml. of plasma only in seasons when the P content of the herbage was at its highest (0·15–0·2%). Nevertheless, the cows in this mineral-fed group bred more regularly, produced more living calves and heavier calves at weaning than the control group which received salt only. The excellent appearance of the mineral-fed cows and their high level of production cause the authors to question whether 4 mg. of inorganic P per 100 ml. of plasma represents the minimum level consistent with good health and production in mature range cows.—W. R. MUIR.

*GAÁL, J., & SZABÓ, M. (1942). Die Änderung der Phagozytierfähigkeit des Retikuloendothels bei A-Hypovitaminose. **[Changes in Phagocytic Power of the Reticulo-Endothelial System in Vitamin A Deficiency].**—*Z. ges. exp. Med.* **110.** 57–59. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **142.** 126]. **1683**

The phagocytic capacity against Indian ink of the reticulo-endothelial system of animals with vitamin A deficiency was definitely lower than that of normal controls. The type of phagocytosis also showed a change in that the transient increase in the size of the ink granules seen in normal controls was not observed in deficient animals. The effects of vitamin A deficiency on the reticulo-endothelial system appeared to be more marked than those of vitamin B_1 deficiency.—A. M. C.

I. JOSEPHS, H. W. (1942). **Factors Influencing the Level of Vitamin A in the Blood of Rats.**—*Johns Hopk. Hosp. Bull.* **71.** 253–264. **1684**

II. JOSEPHS, H. W. (1942). **Studies in Vitamin A. Influence of Vitamin A on Serum Lipids of Normal and Deficient Rats.**—*Ibid.* 265–281. **1685**

I & II. In both studies, rats were put on a vitamin A deficient diet at weaning, and some were given various levels of vitamin A. At intervals rats were killed and estimations made of the vitamin A and total lipoids of the serum and the liver. Results showed that the serum vitamin A remained very constant under wide variations in intake. Complete exhaustion of vitamin A from liver and blood took about 20 days from weaning, but anatomical signs of deficiency did not appear for at

least a week more, sometimes considerably longer. During this period of latency there was a gradual fall in serum lipoid levels, which was not due to any lessened food intake. Liver lipoids fell only slightly, but the fat depots about the body became completely exhausted. Administration of excessive amounts of vitamin A produced a rise in serum lipoids which was transient in non-deficient rats but longer lasting in deficient rats.

It is concluded that vitamin A plays some part in the normal metabolism of lipoids, including the maintenance of a stable level of lipoids in the blood. The latent period between the complete depletion of vitamin A and the appearance of deficiency symptoms may be occupied by metabolic changes, among which, it is suggested, the fall in serum lipoids is important.

—D. G. GILMOUR.

COWARD, K. H. (1941). **The Relative Antirachitic Potencies of Vitamin D_2 (Calciferol from Irradiated Ergosterol) and of Vitamin D_3 (from Irradiated 7-Dehydrocholesterol). A Summary of Experiments Organised for the Accessory Food Factors Committee (Lister Institute and Medical Research Council).**—*Bull. Hlth Org. L.o.N.* **9.** 425–435. **1686**

From biological tests on rats carried out in nine different laboratories by various prophylactic and curative methods, it was established that, for the rat, vitamin D_2 and vitamin D_3 had equal antirachitic potency of 40,000 I.U. per gramme.—A. M. COPPING.

MACFATE, R. P. (1942). **Guanidine and Its Relationship to Muscular Distrophy.**—*J. Lab. clin. Med.* **28.** 50–65. **1687**

The effect of simple guanidine salts upon creatine (methyl guanidine acetic acid) metabolism was determined both in normal g. pigs and in g. pigs in which nutritional muscular dystrophy [N.M.D.] had been induced by feeding on GOETTSCH & PAPPENHEIMER's diet (1931). The M.L.D. of guanidine hydrochloride was determined, and up to four-fifths of a single M.L.D. was administered daily for some weeks: animals so treated developed a condition closely resembling N.M.D. When fed to already dystrophic g. pigs, the toxic effect of the guanidine salt was accentuated. Glycine was found to confer some protection against both guanidine intoxication and N.M.D.

The studies were extended to young dogs, with similar findings. In two of the dogs receiving the N.M.D.-producing diet, the addition of 10% wheat germ was found to prevent the onset of symptoms. [This appears to be further circumstantial evidence that the growing dog requires vitamin E.]—A. N. WORDEN.

HUGHES, E. H., & SQUIBB, R. L. (1942). **Vitamin B_6 (Pyridoxine) in the Nutrition of the Pig.**—*J. Anim. Sci.* **1.** 320–325. **1688**

Two attempts to induce vitamin B_6 deficiency in young pigs failed, the failure being related to moulds and yeasts which grew on the floors of the pens and were ingested by the experimental animals. When care was taken to prevent these growths, a deficiency was readily produced by feeding on a basal diet deficient in pyridoxine but adequate in other respects.

Inappetence, roughness of coat, and unsteadiness of gait appeared after 3–4 weeks, by six weeks scouring had commenced and the blood haemoglobin levels had fallen markedly, and at the end of ten weeks all the deficient animals were suffering from epileptiform fits. The nervous and other symptoms correspond closely with those described by CHICK *et al.* [*V. B.* **10.** 956.] as occurring in "eluate factor" deficient animals, thereby affording further evidence that the condition described by these investigators was, in fact, a vitamin B_6 deficiency. It was possible to obtain excellent recoveries in some of the animals by feeding pyridoxine at the rate of 5 mg. per 100 lb. body weight daily. Control animals which received this level of dosage throughout remained normal in all respects.—A. N. W.

RHIAN, M., EVANS, R. J., & ST. JOHN, J. L. (1943). **The Choline Content of Feeds.**—*J. Nutrit.* **25.** 1–5. **1689**

Some 17 poultry foodstuffs, mostly cereal, legume, and animal products, and a number of compounded rations were analysed for choline content. The perosis-preventing value of some of the diets was known, and the relationship between the choline content (methyl alcohol extraction) and this value was fairly close, the coefficient of correlation being −0·884.—A. N. WORDEN.

JUKES, T. J. (1940). **Reproduction in Rats on Synthetic B-Complex Supplement.**—*Proc. Soc. exp. Biol., N.Y.* **45.** 625–627. **1690**

In a search for unidentified nutritional factors, rats were fed a synthetic diet in which all the fat-soluble factors were supplied in the form of natural or processed oils, but the vitamin B complex was fed in the form of known chemical compounds. It was found possible to produce healthy first and second generation offspring, but the reproductive performances were considerably inferior to those obtainable with a normal diet of natural foods. It would, therefore, appear that some necessary factor of the B complex was missing from the synthetic diet.—ALASTAIR N. WORDEN.

JOHNSON, E. L., CARRICK, C. W., ROBERTS, R. E., & HAUGE, S. M. (1942). **Evidence of New Growth Factors For Chicks.**—*Poult. Sci.* **21.** 566–570. **1691**

In a series of growth experiments with initially day-old chicks (Barred Plymouth Rock and Rhode Island Red × Barred Plymouth Rock), evidence was obtained that an essential B-vitamin [or vitamins] other than B_1, B_6, riboflavin, nicotinic acid, *p*-aminobenzoic acid and choline was present in both liver meal and Argentine casein. Ether or ethyl alcohol extracts of the casein were active, and the activity was not destroyed by heat.—ALASTAIR N. WORDEN.

See also absts. **1657** (osteoporosis in cattle), **1721** (fluorine in mineral supplements), **1771** (diet in avian leucosis).

PHYSIOLOGY AND ANATOMY

ATKESON, F. W., SHAW, A. O., & CAVE, H. W. (1942). **Grazing Habits of Dairy Cattle.**—*J. Dairy Sci.* **25.** 779–784. **1692**

Observations were made during 12-hour daylight periods upon the time spent by dairy cattle [breed not stated] in grazing on "good", "fair", and "poor" pastures respectively. On the good pastures, the animals spent slightly less than half the time in grazing and lay down on the average four times daily. On the fair pasture, 55%, and on the poor pasture, 62% of the time was spent in grazing, and in each case the animals on the average lay down twice daily. The frequency of drinking (3–4 times daily) was apparently unconnected with pasture quality.

Further observations were made upon a herd of 56 cows which were on Balbo rye pasture without supplementary feeding. During the 24-hour period, an average of seven hours was spent in grazing, four hours in standing or walking, and 13 hours in lying. Much more grazing was carried out by day, when the animals were lying down for 35% of the time, than at night, when 80% of the time was spent in lying. [See also

GRANT *et al.*—*V. B.* **12.** 604.]—A. N. WORDEN.

*VARIĆAK, T. (1941). **[Localization of Iron in the Chorion in Cattle and Swine].**—*Vet. Arhiv.* **11.** 279–287. [Abst. from abst. in *Wien. tierärztl. Mschr.* **29.** 378]. **1693**

KÖPPING described in the foetal membranes of cattle, sheep, and pigs characteristic macroscopically visible greyish-white deposits which were identified as Ca. They make their appearance in the chorion only during certain stages of development. In examining these Ca deposits for associated Fe, it was found that in the villus-free areas of the chorion there was a large deposition of Fe, and it is suggested that this area is the site of the Fe reserve of the placental foetus.

The cotyledons are free from macroscopically visible deposits of iron. In the pig the Fe deposits are distributed in the larger portions of the foetal sac. In the cow Fe is seen in the trophoblasts and in the deeper layers of the propria. In the foetal placenta of the pig, Fe is deposited chiefly in the vertical and deep horizontal section of the chorion propria.—G. D. S.

BARCLAY, A. E., BARCROFT, J., BARRON, D. H., FRANKLIN, K. J., & PRICHARD, M. M. L. (1942). **Pulmonary Circulation Times before and after Functional Closure of the Ductus Arteriosus.**—*J. Physiol.* **101.** 375–377. **1694**

From X-ray cinematograph films of the circulation in foetal lambs, the authors have determined 37 pulmonary circulation times in the records of 13 foetuses. The times are remarkably small. With the ductus arteriosus open the average time was 2·7 sec., on closure of the ductus this was reduced to 1·4 sec.

Eight times were obtained for the circuit from the brachiocephalic artery to the anterior vena cava; these were about 10 sec. in a 100-day-old foetus and about 5 sec. at 140 days. The significance and cause of this decrease is not yet known. [See also BARCROFT—*V. B.* **13.** 27.]—ALFRED T. COWIE.

*BÜRKER, R. (1941). Über Gesetzmässigkeiten, die roten Blutkörperchen und die Blutgerinnung betreffend. **[Red Blood Corpuscle and Coagulation Constants in Domestic Animals].**—*Arch. Sci. Biol.* **27.** 101–105. [Abst. from abst. in *Jber. Vet.-Med.* **69.** 245]. **1695**

The Hb content of a single erythrocyte of various species (in 10^{-12}g.) was :– human, 32 ; goat, 8 ; sheep, 11 ; cat, 16 ; horse, 18 ; cattle, 19 ; rabbit, 20 ; pig, 22 ; dog, 24. The content is proportional to the square of the diameter. Clotting time at 25°C. for various species was :– horse, 11·5 ; cattle, 6·5 ; rabbit, 4·5 ; pig, 3·5 ; dog, sheep, and goat 2·5 min.—J. G. CARR.

COPLEY, A. L., & ROBB, T. B. (1942). **Studies on Platelets. I. The Method of Vilariño and Pimental and a New Direct Method of Counting Blood Platelets.**—*Amer. J. clin. Path.* **12.** 362–371. **1696**

The authors give a detailed description of the Vilariño & Pimental technique of counting blood platelets. They find the method very reliable but laborious, and they have evolved a direct method of counting the platelets which is much simpler, and in which the counts correspond with those made by the Vilariño-Pimental method within ±2·5%. In their method the blood sample is collected by venepuncture in modified Aynaud solution, brilliant cresyl blue is used as a stain, and the platelets are counted in a modified Neubauer chamber. 127 platelet counts were made from 47 normal dogs and gave an average of 254,000 platelets (range 127,000 and 428,000).—A. T. COWIE.

*RAJCSÁNYI, L. (1941). **[Partition of Proteins in Blood Sera of Horses and Cattle].**—*Inaug. Diss., Budapest.* pp. 16. [Abst. from abst. in *Jber. Vet.-Med.* **69.** 246.] **1697**

In cattle the albumin and globulin of the blood serum comprise 2·88% and 5·3% respectively. For horses the figures are 2·22% and 6·08%. Cattle have the greater euglobulin content. Total N and amino-N contents are similar ; residual N is slightly greater in the horse. [See also abst. **1666.**]—J. G. CARR.

COHN, E. J. (1941). **The Properties and Functions of the Plasma Proteins, with a Consideration of the Methods for their Separation and Purification.**—*Chem. Rev.* **28.** 395–417. **1698**

The physico-chemical characteristics of the plasma proteins, including comparative studies on the physical, chemical, and immunological properties of bovine, of chemically modified bovine, and of human albumins and globulins, are discussed. Albumin solutions with their high osmotic pressure, low viscosity, and great stability are suggested as the most useful plasma proteins for the treatment of conditions associated with diminished plasma volume, and the idea is advanced that purified, chemically modified bovine albumins may prove suitable for some types of human transfusion work.—J. LOCHIEL MCGIRR.

*BERNÁT, J. (1941). **[Sodium Content of Horse Blood].**—*Közl. Összehas. élet- és kórtan Köréből.* **29.** 424. [Abst. from abst. in *Jber. Vet.-Med.* **69.** 73]. **1699**

Using Dreguss' method, and Deseö's revision of the calculation (the validity of which B. has confirmed), B. found the normal Na content of the blood plasma and serum to vary little from 333·6 mg. % ; the whole blood content was 219·6 mg. %. The content of the red cells was variable, ranging from 21·12–41·14 mg. %, average 31·2 mg. %. The value for plasma did not alter after progressive bleeding.—J. G. CARR.

*BAJKA, A. (1941). **[Chlorine Content of the Blood of Horses, Goats, Sheep, and Lambs].**—*Inaug. Diss., Budapest.* pp. 16. [Abst. from abst. in *Jber. Vet.-Med.* **69.** 247]. **1700**

The Cl content, in mg. % of horse whole blood was 263, but it varied noticeably. The serum and plasma values were more constant, averaging 343 and 341 respectively. All values were higher in goats, with only insignificant individual variations. Slight variations were seen in sheep whole blood, though the plasma values were constant ; the values obtained for lambs were similar.—J. G. CARR.

GROLL, E. (1941). Untersuchungen zur Feststellung des Säure-Basenverhältnisses im strömenden Blut von gesunden und kranken Tieren. **[Determination of Acid-Base Equilibrium in Circulating Blood of Healthy and Sick Animals].**—*Berl. Münch. tierärztl. Wschr.* Jan. 31st. 53–56. **1701**

G. determined the pH of the venous blood in cattle by direct insertion of the electrode. Values up to 7 were usually found in disease-free animals and over 7 in diseased animals. The following results were obtained on animals afterwards slaughtered and examined. pH up to 7 in 67 disease-free animals, 8 with distomatosis, 15 with TB., 2 with liver abscesses, and 2 with peritonitis. pH over 7 in 65 with TB., 8 with brucellosis, 1 with distomatosis, 1 with pericarditis, 1 with peritonitis, and in 4 healthy animals (not examined for brucellosis).—J. G. CARR.

LASNITZKI, A., & BREWER, A. K. (1942). **An Isotopic Shift of Potassium in Human Bone-Marrow and Cancer. [Correspondence].**—*Nature, Lond.* **149.** 357–358. **1702**

Studies of the isotopic constitution of K in human tissues furnish results in agreement with those

of previous investigations on animal tissues (rat, horse, bovine). The content of the heavy isotope $^{41}_{19}$K is 1·5% greater in the K of bone marrow and 1% smaller in the K of cancerous tissues compared with normal tissues and pure KCl.—W. R. MUIR.

KALEFF, B. (1942). Der Hausbüffel und seine Züchtungsbiologie im Vergleich zum Rind. **[The Breeding Biology of the Domestic Buffalo Compared with that of Cattle].**—*Z. Zücht B.* **51.** 131–178. **1703**

The present-day types, the Asiatic flat-horned and the African round-horned, are both descended from the Indian wild buffalo or Arni. The buffalo is sensitive to extremes of cold and heat and, as it is less able to adapt itself to colder climates than cattle, its distribution is limited. In Bulgaria the buffalo reaches its maximum growth between four and six years of age. The black pigmentation of its skin, hair, etc. is characteristic. The buffalo has a greater resistance to disease, its body temperature (37·8°–39·2°C.) is slightly lower, and it has a more sensitive sense of smell and of taste than cattle. Milk production ranges from 2,000–4,000 litres annually and the fat and solids are in higher percentage than in cow's milk. The female is first bred at three years of age and may continue breeding up to 16–18 years of age; the breeding life of the male is from two years of age to 8–10 years. In the buffalo cow heat lasts for 24–36 hours, rarely for 48 hours. It may recur after 2, 3, or 4 weeks or after still longer periods, but three weeks is the most frequent cycle. Service and calving periods are usually in the autumn and winter months. Gestation lasts 302–328 days. In healthy animals the first ovulation after calving usually occurs at an average interval of 118 days, but there is great variation due to nutrition, management, disease, etc. —N. J. SCORGIE.

LANDAUER, W. (1941). **The Hatchability of Chicken Eggs as Influenced by Environment and Heredity.**—*Bull. Storrs agric. Exp. Sta.* No. 236. pp. 124. **1704**

This bulletin, which is a revision of bulletin 216, contains a very useful summary of the results of observations carried out in order to determine the effect of various factors upon hatchability. Over 400 references to the literature are cited.

The survey covers the physical and chemical environment of hatching eggs, external and internal egg characters, nutritional factors, metabolism, age, and reproductive activity of parent stock, in relation to hatchability. The effects of genetic factors and embryonic development are discussed at length. —F. D. ASPLIN.

ANDERSON, J. (1942). **Artificial Insemination and Community Breeding of Cattle.**—*E. Afr. agric. J.* **8.** 2–8. **1705**

A short review is given of the development of, and the advantages derived from, organized community breeding and bull associations in the U.S.A., Denmark, and Jersey. The application of artificial insemination to community breeding is discussed, and A. points out that where bull associations are already in existence the change-over to artificial insemination is easy. It is also pointed out that co-operative artificial breeding includes all the desirable features of the older methods of community breeding, but also offers many additional advantages. Attention is focussed on the possibilities of communal breeding through artificial insemination in Kenya where it was first started in 1935 as a means of controlling certain genital diseases; about 20,000 cows are now being inseminated annually. So far, artificial insemination has been used solely by the farmer on his farm, but it is stated that one community bull scheme was about to be put into operation (September 1941). A. describes the method of running an organized artificial breeding centre and considers the aspects relating to detection of oestrus and its notification to the centre, distribution of semen and insemination of the cows, and the keeping of records.—N. J. SCORGIE.

BLACK, D. J., & SCORGIE, N. J. (1942). **The Collection of Semen and Artificial Insemination in the Domestic Fowl.**—*Vet. J.* **98.** 108–114. **1706**

A method is described for the collection of semen and the artificial insemination of domestic poultry. The method of collection is substantially that described by BURROWS & QUINN (1937) and the insemination of the hen is carried out by injecting the semen directly into the oviduct. Over a period of one month 39 hens were artificially inseminated with 0·1 ml. of diluted semen (equivalent to 0·05 ml. undiluted). Thirty-three of the hens produced one or more fertile eggs, whilst six birds laid eggs which were consistently infertile. The greatest number of fertile eggs was produced in the third and fourth weeks of the experiment, after each hen had been inseminated a number of times. The earliest interval after insemination at which a fertile egg was laid was 48 hours and the longest interval after the last insemination was 11 days. The possibility of applying artificial insemination to poultry breeding is discussed in the light of the results obtained. It is suggested that the method presents practical possibilities for the general improvement of poultry stocks by the distribution of semen from proven males kept at a state-aided progeny-testing station.

HUGGINS, C., & NEAL, W. (1942). **Coagulation and Liquefaction of Semen. Proteolytic Enzymes and Citrate in Prostatic Fluid.**—*J. exp. Med.* **76.** 527–541. **1707**

The experiments reported deal with various phases of the effects of semen and its components on blood and its clotting constituents. Some specimens of human semen were found to shorten the coagulation time of blood because of the presence of active thromboplastic agents, whilst other samples prolonged its coagulation time. Human prostate fluid, due to its high concentration of citrate, in large amounts, always delayed or abolished blood coagulation. Most specimens of dog semen shortened the coagulation time, but some were found to contain a fibrinogen-inactivating agent which rendered blood incoagulable. The prostatic fluid of both man and dog was found to contain a large amount of a fibrinolysin which appears to resemble the fibrinolysin associated with haemolytic streptococci.—N. J. S.

EASLEY, G. T., MAYER, D. T., & BOGART, R. (1942). **Influence of Diluters, Rate of Cooling, and Storage Temperatures on Survival of Bull Sperm.**—*Amer. J. vet. Res.* **3.** 358–363. **1708**

It was found that the only diluents capable of prolonging sperm survival (motility) beyond that in undiluted semen were phosphate buffer and yolk-phosphate, the latter being superior to all others, particularly for the longer storage times. All the GPC (glucose-phosphorus-calcium) diluents produced definite decreases in motility and in the number of live sperms upon addition to the semen, and were markedly harmful to sperm survival during storage. Tartrate and sulphate diluters did not produce comparable immediate decreases in motility, but semen diluted with them did not store as well as undiluted semen. Examination of the physical and clinical characters of the different diluents suggested that in any diluter used for the storage of bull semen the pH, buffering capacity, and osmotic pressure should be well within the physiological range for these characteristics of normal bull semen.

In the storage of undiluted bull semen, it is shown that there is a definite relationship between the rate of cooling and sperm survival; the most satisfactory rate of cooling was a decrease of 5°C. at 90-min. intervals. On the basis of motility and sperm survival, 5°C. proved to be the best temperature for storage. Addition of yolk-phosphate diluent protected the sperm from the detrimental effects of rapid cooling and reduced the detrimental influence of storage temperature.

It is stressed that a distinction should be made between media which act as diluents only, and hence may be suitable for dilution of semen for immediate insemination, and diluents which, in addition, are capable of prolonging sperm survival during storage. Evidence from the results of the present investigation and from those of other investigators is cited to indicate that there may be differences in the storage potentialities of bull semen studied in different localities.—N. J. S.

RANSON, R. M. (1941). **Pre-Natal and Infant Mortality in a Laboratory Population of Voles** (*Microtus agrestis*).—*Proc. Zool. Soc.* Ser. A. **111.** 45–57. **1709**

R. describes a technique for counting by palpation the number of embryos in the vole. Using this method it is possible to assess accurately the number of embryos between the 5th and the 17th days after conception. 382 pregnancies were considered; only litters from voles kept under optimum conditions of light, temperature, and food were examined. Parent voles were of two types, normals and "rogues", the latter being those which had absorbed or killed 50% of their litters by the time of, or immediately after, birth. Once a vole has shown these tendencies it is unusual for it to return to normal breeding life. Of the pregnancies considered, 70 (18·32%) were produced by parents one or both of which were "rogues", and 312 (81·68%) were produced by normals.

The results showed a pre-natal mortality of at least 21·07%. 14·20% of the young born alive die during the 14 days between birth and weaning, giving an accumulated loss of at least 32·28% for the first 35 days of existence. The sex ratio at weaning was $50{\cdot}89 \pm 2{\cdot}22$ males %.—D. L. HUGHES.

WALLER, H. K. (1943). **A Reflex Governing the Outflow of Milk from the Breast.**—*Lancet.* **244.** 69–72. **1710**

Using the method of fractional milking and fat analysis, W. has shown that in the human being, there is a reflex mechanism to control the outflow of milk—the "draught" reflex. This would appear to be analogous to the reflex in the cow, and is likewise highly susceptible to interference and conditioning. The clinical significance of this reflex is discussed at some length.—ALFRED T. COWIE.

LYONS, W. R. (1942). **The Direct Mammotrophic Action of Lactogenic Hormone.**—*Proc. Soc. exp. Biol., N.Y.* **51.** 308–311. **1711**

Localized sector lactation was produced in virgin ovario-hysterectomized rabbits by injecting 3–6 I.U. of lactogenic hormone intraductally into the mammary gland. The glands were previously developed by oestrone-progesterone treatment so that the mammary growth was similar to that of a three weeks' pregnant rabbit. Thirty rabbits on five dosage levels were used in the experiment. Only one of the six ducts of each gland was injected with hormone but one or two others were injected with an equal volume of control solution. Milk was present in the hormone-treated sectors after 24 hours, increasing till the fifth day and persisting until the tenth day.—ALFRED T. COWIE.

MEITES, J., & TURNER, C. W. (1942). **Studies Concerning the Mechanism Controlling the Initiation of Lactation at Parturition. I. Can Estrogen Suppress the Lactogenic Hormone of the Pituitary? II. Why Lactation is Not Initiated During Pregnancy. III. Can Estrogen Account for the Precipitous Increase in the Lactogen Content of the Pituitary Following Parturition?**—*Endocrinology.* **30.** 711–718, 719–725 & 726–733. **1712**

I. Twenty-four parturient albino rats were divided into four groups:—(a), controls, were allowed to nurse their litters; (b) and (c) were given 2·0 mg. diethylstilboestrol and 2·0 mg. testosterone propionate respectively for six days, and (d) never suckled their litters. All rats were killed on the seventh day. The lactogen content of the pituitaries of groups (b) and (c) were similar to that of (a), the milk in the mammary glands was somewhat less, and the death rate of their litters was somewhat higher. In group (d) the pituitaries contained 50% less lactogen than in the other groups and there was practically no milk in the mammary glands.

Sixty-five male g. pigs were injected with doses of diethylstilboestrol ranging from 0·0125–100·0 mg. over a period of five days. In every case there was an increase in the lactogen content of the pituitary; the maximum increase (438%) was obtained with doses of 0·20 mg.

It is concluded that there is no evidence that oestrogens can inhibit lactation by suppressing the production of lactogen, although it may decrease other anterior pituitary hormones and so affect the availability of the precursors of milk. The sucking stimulus is necessary for the maintenance of lactation and high postpartum lactogen production. [See also BARNES—*V. B.* **12.** 551.]

II. Four groups of ten female g. pigs were paired, and 20 received doses of oestrone ranging from 25–200 I.U. over a five-day period, and 20 received the oestrone and 5 mg. progesterone. There were ten controls and eight receiving progesterone alone. After autopsy on the sixth day the controls and progesterone-treated animals had a similar lactogen content in the pituitaries; the oestrone-treated animals had a higher lactogen content. From the lactogen assays on the oestrone-progesterone-treated animals, it is concluded that when the gravimetric ratio of progesterone to oestrone is 250 : 1, oestrone over-rides the effects of progesterone, but when the ratio is about 2,000 : 1, progesterone completely over-rides the effects of oestrone. It is believed that these results explain why the lactogen content of the pituitary remains low during pregnancy and so is insufficient for the initiation of lactation. [See also KOCH—*V. B.* **11.** 727.]

III. Forty male g. pigs were injected with 0·3 mg. oestrone over periods ranging from 1 to 30 days. It was found that a maximum lactogen stimulation could be obtained in five days.

Four New Zealand White rabbits, hysterectomized on the 20th day of pregnancy, showed an average increase of 83% of lactogenic hormone when killed five days later.

These results indicate that oestrogen can account for the rapid increase found in the lactogen content of the pituitary of laboratory animals 2–5 days postpartum, and that the predominant influence of progesterone during pregnancy must be removed before oestrogen can effect this increase.—ALFRED T. COWIE.

NEUFELD, A. H., & COLLIP, J. B. (1942). **The Primary Action of the Parathyroid Hormone.**—*Endocrinology.* **30.** 135–141. **1713**

Following injections of parathyroid extract, the serum calcium and serum inorganic phosphate were studied in normal, nephrectomized, and ureter-ligated rats, cats, and dogs. In the nephrectomized and ureter-ligated animals the customary rise of serum Ca was not

produced. In the rats the serum P rose; this rise was less marked in the dogs and cats.

Normal dogs treated with parathyroid extract and given sodium acid phosphate intravenously to maintain a constant serum P level, showed no rise in serum Ca.

During complete anuria in dogs, produced by posterior pituitary extracts, no rise in serum Ca was observed following parathyroid extract injections and the serum P remained practically constant.

These results favour the theory that the parathyroid action is primarily associated with the excretion of P by the kidney rather than with the activity of the osteoclasts of bone tissue.—ALFRED T. COWIE.

SELYE, H. (1942). **Mechanism of Parathyroid Hormone Action.**—*Arch. Path.* **34.** 625–632. **1714**

Groups of thyroidectomized, nephrectomized, partially hepatectomized, and untreated albino rats were given three injections of 20 units of parathyroid extract at two-hour intervals; 20 hours after the first injection the rats were autopsied. In all groups the bones revealed an advanced degree of osteoclastic absorption; metastatic calcification was not marked in the hearts or kidneys.

A second series of experiments showed that the parathyroid hormone was more toxic to nephrectomized than to normal rats.

It was demonstrated by a third series of experiments that nephrectomy itself elicited slight osteitis fibrosa; this could be completely prevented by simultaneous parathyroidectomy.

It is concluded that the thyroid, kidney, and liver are not necessary for the action of the parathyroid hormone and that it does not act on the bones through the intermediary of the kidney as has been postulated by other workers. [See also EGER—*V. B.* **11.** 38.]
—ALFRED T. COWIE.

KENDALL, E. C. (1941). **The Adrenal Cortex.**—*Arch. Path.* **32.** 474–501. **1715**

This is a comprehensive review of the physiology of the adrenal cortex. The range and different actions of the various cortical hormones are stressed. The association between certain molecular groupings and physiological action, such as the importance of the atom of oxygen attached to carbon 11, is discussed. The physiological actions of the cortical hormones which influence carbohydrate metabolism and of those which affect the distribution and excretion of electrolytes are reviewed and also the relation between the cortical hormones and those of other endocrine glands. Twelve methods of assaying cortical hormones are mentioned. [See also LOEB, R. F.—*V. B.* **13.** 28.]—A. T. COWIE.

SELYE, H. (1941). **Variations in Organ Size Caused by Chronic Treatment with Adrenal Cortical Compounds. An Example of a Dissociated Adaptation to a Hormone.**—*J. Anat.* **76.** 94–99. **1716**

It is recalled that, in previous experiments lasting 20 days or less, daily injections of desoxycorticosterone acetate into albino rats were found to cause involution of the thymus, spleen and adrenal cortex, accompanied by enlargement of the kidneys and decrease in blood chlorides. Further experiments are described, in which daily injections of this same hormone were continued for two months. This relatively prolonged treatment resulted in enlargement of the thymus and spleen while changes in other organs remained the same as those observed in the short-term experiments. It is doubtful, at present, whether a true inversion of the hormone action is revealed by those observations, but it is considered that the experiments do show that a "dissociated adaptation" to a hormone action may be acquired by a certain organ without any change in the sensitivity of the body to other effects of this hormone. Histological examinations are not reported.—W. R. M.

LIPSCHÜTZ, A. (1942). **Experimental Fibroids and the Antifibromatogenic Action of Steroid Hormones.**—*J. Amer. med. Ass.* **120.** 171–175. **1717**

Uterine and abdominal fibroids can be elicited in the g. pig by continuous prolonged treatment with oestrogens; if the treatment is intermittent, fibroids are not produced. All oestrogens, especially the 17-caprylic ester of oestradiol, are fibromatogenic. When the oestrogen is combined with progesterone, testosterone propionate, desoxycorticosterone acetate, or dehydrocorticosterone, the fibromatogenic action is largely inhibited.

The tumourigenic and antitumourigenic action of steroid hormones varies greatly according to the species. [See also NELSON—*V. B.* **11.** 809.]—A. T. COWIE.

*HÖSER, J. (1941). Altersveränderung der Hypophyse des Pferdes. [**Age Changes of the Pituitary Body of the Horse**].—*Inaug. Diss., Hanover.* [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **50.** 171]. **1718**

The weight of the pituitary increases with bodily growth and remains constant in the adult up to about ten years, when it begins to decline. The cell-picture changes in a complex manner not in accordance with fixed principles. The parenchyma atrophies in old age. The collagen connective tissue and the lattice fibres gradually develop during growth to a maximum at puberty. Cysts containing colloid were often seen in the glandular and intermediate parts, and nodular hyperplasia and adenomas appeared as age advanced; macroscopically visible nodules and protuberances appeared in old age. Sclerotic changes were seen in two specimens and amyloid in one.

WOLFE, J. M., & WRIGHT, A. W. (1942). **The Fibrous Connective Tissue of the Artificially Induced Maternal Placenta in the Rat with Particular Reference to the Relationship between Reticulum and Collagen.**—*Amer. J. Path.* **18.** 431–461. [Authors' summary copied *verbatim*]. **1719**

1. The fibrillar material in deciduomata of the rat has been studied by methods in general use for the differentiation of reticulum and collagen.

2. The fibrillar elements ranged from fine fibrils to fibers approximately 3μ in width. The fine fibrils were almost always reticular in nature. The thick fibers were sometimes reticular, but more often they were either collagenous or transitional between reticulum and collagen. It was found that the fibrous material in deciduomata of the rat was derived from that of the normal endometrium which underwent marked changes during the development of the decidual growth. Evidence is presented to show that under certain circumstances collagen may be transformed into reticulum.

3. The relationship between reticulum and collagen is discussed and factors regulating their staining reactions are considered. It is suggested that certain localized factors might influence the staining reaction of connective tissue fibers.

*EDLAND, H. (1941). [**Nerves of the Pelvic Cavity in Domestic Animals**].—*Norsk VetTidsskr.* **53.** 343–363. [Abst. from abst. in *Wien. tierärztl. Mschr.* **29.** 217]. **1720**

Discussion on the course of the pelvic nerves in the various farm animals with reference to their vulnerability from pressure by the foetus. E. concludes that all the courses of these nerves are so situated that they are well protected from such pressure in all the farm animals except cattle.

See also absts. **1666** (blood proteins of cattle and horses), **1638** (blood of rabbit), **1670** (lactation and fertility in cattle), **1677** (artificial insemination and sterility), **1812** (breeding of farm animals).

POISONS AND POISONING

HATFIELD, J. D., SHREWSBURY, C. L., & DOYLE, L. P. (1942). **The Effect of Fluorine in Rock Phosphate in the Nutrition of Fattening Lambs.**—*J. Anim. Sci.* **1.** 131–136. **1721**

The experiments were designed to discover the fluorine tolerance of fattening lambs when rock phosphate is used as a mineral supplement to a ration of ground yellow maize and alfalfa hay. The rock phosphate contained 3·85% of fluorine and was fed in amounts supplying nil, 1·5, 3·0, and 6·0 mg. F per kg. body weight per day for a period of 170 days. The Ca and P contents of the diets were balanced by additions of steamed bone meal. Growth and food consumption were depressed at the highest level of F intake, but the best average liveweight gains were made by animals receiving 3 mg. F per kg. body weight per day. The total weights and breaking strengths of the bones were also greatest at this same level of F intake, but the breaking strength per g. of bone was decreased at all levels of F intake and to a marked extent as the F contents of the diet and bones increased. Serum Ca decreased and serum inorganic P increased as the intake of F increased, but it was considered that the observed levels of these blood constituents still remained within the normal range. The teeth of two animals ingesting the highest amount of F showed discoloration, but all the other experimental animals had excellent teeth. The fresh and dry weights of the thyroid glands decreased, but both the percentage and total content of iodine increased as the level of F in the diet increased. It was noted that both water and salt consumption increased with the F intake and, since the salt contained traces of iodine, the intake of iodine also increased.
—W. R. MUIR.

*LOURENS, L. F. D. E. (1941). **[Fluorosis in Cattle].**—*Tijdschr. Diergeneesk.* **68.** 229–243. [Abst. from abst. in *Wien. tierärztl. Mschr.* **29.** 209]. **1722**

In the neighbourhood of an artificial manure works cattle became ill with symptoms of emaciation, paralysis and loosening of the teeth. Pregnant and newly calved cows were most severely affected. At autopsy tooth anomalies, necrosis of gums, bony exostoses, and a fluorine content of bone about ten times greater than normal were found. The fluorine was apparently absorbed not only from the pasture but also from hay.
—A. M. COPPING.

PAINTER, E. P. (1941). **The Chemistry and Toxicity of Selenium Compounds, with special reference to the Selenium Problem.**—*Chem. Rev.* **28.** 179–213. **1723**

The first part of this review article deals with the agricultural problems arising from the occurrence of toxic amounts of selenium in soils and pastures in extensive areas in the western Great Plains of the U.S.A. The toxicity of Se to animals and man is discussed and it is pointed out that little is known of the mechanism of Se poisoning in the animal body. The second part is devoted to methods of estimating Se in soils, plants, and animal tissues. Part III deals extensively with the chemistry of organic compounds of Se, and part IV discusses the properties of Se in plants and their relation to known compounds of Se and sulphur. An extensive list of references is given.—R. ALLCROFT.

*GABEL, W. (1940). Zur Bewertung des Bleigehaltes der Leber. **[Estimate of Lead Content of the Liver].**—*Arch. exp. Path. Pharmak.* **195.** 383–388. [Abst. in *Jber. Vet.-Med.* **68.** 18]. **1724**

This is a similar article to one already abstracted [see GABEL—*V. B.* **12.** 607].—E. R. PARISER.

*FEHÉR, T. (1941). **[Poisoning of Farm Animals: Observations on Phosphorus Poisoning].**—*Közl. Összehas. élet- és kórtan Köréből.* **30.** 178. [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **50.** 451]. **1725**

Deaths among pigs and poultry occurred on a farm in the late summer when maize grits mixed with phosphorus had been put down to poison mice in a field adjoining the pig pasture. For the first three weeks after the poison was laid the weather was wet and few dead mice were found, but a sudden dry spell brought many deaths among mice and 104 sows on the pasture contracted phosphorus poisoning; four dogs and 240 fowls also died. Many dead mice were found in the stomach contents at P.M. examination of 24 sows. The pigs were taken from the pasture and given a dilute solution of $KMnO_4$ and then new milk to drink. Only two more deaths occurred; the other sick animals recovered and no further illness developed.—A. M. C.

WHITEHEAD, F. E. (1938). **The Effect of Arsenic, as Used in Poisoning Grasshoppers, Upon Birds.**—*Bull. Okla. agric. Exp. Sta.* No. 218. pp. 55. **1726**

From experiments conducted on the feeding to chickens of grasshoppers poisoned with arsenic, it was found that chickens will eat less than one half the number of poisoned grasshoppers that they will of unpoisoned grasshoppers. The amount of As consumed in this way is less than one-half of a lethal dose. From the results of the experiments it is concluded that sufficient As is never consumed by chickens to constitute a dangerous dose for human beings eating the chickens.
—G. D. S.

TEMPERTON, H., & DUDLEY, F. J. (1943). **A Note on the Feeding of a Cocoa Waste to Poultry.**—*Harper Adams Util. Poult. J.* **28.** 12–14. **1727**

A description is first given of the methods employed in the manufacture of commercial cocoa and the consequent production of waste materials. Some of the literature on the subject is examined.

Four groups each of four pullets were fed a mixture of laying meal and quantities of undecorticated cocoa cake meal varying in the rations from 10–30% either as wet or dry mashes. Deaths began to occur on the fifth day of the trial and eight birds, one or more from each group, died within nine days, presumably from theobromine poisoning. The suggestion is made that this drug has a cumulative effect.—J. C. BUXTON.

MCCULLOCH, E. C. (1942). **The Use of Grain Containing Tarweed (Amsinckia Intermedia) Seed as Poultry Feed.**—*J. Amer. vet. med. Ass.* **101.** 481–483. **1728**

The toxicity of *Amsinckia intermedia* seed was investigated and it was found to be non-toxic for poultry when fed in amounts occurring in unscreened western wheat. It is pointed out that the feeding trials were limited and therefore not conclusive.—A. BUXTON.

MATHEWS, F. P. (1942). **Fern (*Notholaena Sinuata*, var. *Crenata*) Poisoning in Sheep, Goats and Cattle—the So-Called "Jimmies" of the Trans-Pecos.**—*Bull. Tex. agric. Exp. Sta.* No. 611. pp. 15. **1729**

This disease of sheep, goats, and cattle which occurs in rocky limestone areas of the Trans-Pecos and is referred to as "jimmies" was reproduced by feeding the fern *N. sinuata* var. *crenata* which grows in central Texas, California, and Mexico. The greatest losses occur in sheep, and although goats and cattle are susceptible, they appear to be much more resistant, particularly cattle in which the disorder is not fatal. Cases usually begin to occur about the middle of December and continue until about three weeks after

green food becomes available in the spring. The characteristic symptom is violent trembling and sudden death, both of which are induced by exercise. Recovery from the toxic effects of the plant are frequently obtained 5–19 days after cessation of ingestion.

Control measures indicate that pastures infested with the plant should be confined to goat or cattle grazing. If sheep are kept in these areas the pastures should be small and the sheep should not be interfered with during the winter months.—G. D. S.

EMMEL, M. W., SANDERS, D. A., & SWANSON, L. E. (1942). **The Toxicity of Foliage of Aleurites Fordi for Cattle.**—*J. Amer. vet. med. Ass.* **101.** 136–137. **1730**

Fourteen pure-bred Hereford and Aberdeen Angus cattle from a herd of 44 died as a result of feeding on the foliage from branches of the tung-oil tree which had been discarded in their pastures. Two heifers which were force-fed 1·25 and 1·76 lb. respectively developed symptoms of poisoning. The outstanding symptoms in cattle consisted of haemorrhagic diarrhoea which usually became more or less watery, loss of appetite, unthriftiness and emaciation. The most pronounced P.M. lesions were haemorrhagic gastro-enteritis and passive congestion of the visceral organs. Granular degeneration with small scattered areas of necrosis were predominant in the tissues of the visceral organs, particularly of the liver, kidneys and intestines. —G. D. S.

VAIL, E. L. (1942). **Woolly-Pod or Broad-Leafed Milkweed (Asclepias Eriocarpa) Poisoning of Rabbits.** —*N. Amer. Vet.* **23.** 539–542. **1731**

Milkweed or woolly-pod (*Asclepias eriocarpa*) which grows in large areas of California and especially throughout southern California is poisonous when ingested by domestic or wild rabbits. All parts of the plant, fresh or dry, are poisonous. The most pronounced symptoms are progressive anterior and posterior paralysis. The animals first assume a "hunched" position and later become prostrate and comatose, after which death occurs within a few hours. On autopsy the blood vessels are congested and practically all the vital organs are found to be haemorrhagic. Rabbits seldom eat the plant except when it is mixed with hay and straw. Death occurs after the consumption of about 30–40 g. of the fresh plant. Recovery may be obtained if affected animals can be induced to eat large amounts of green food, which acts as a mechanical laxative, eliminating the poisonous elements from the body.—G. D. S.

—. [Undated]. **Some Poisonous Plants of New York State.** pp. 12. Ithaca, N.Y.: New York State College of Agriculture. [4to] [Mimeographed]. **1732**

Fifty-seven different species of poisonous plants to be found in New York State are named and grouped under three headings, (a) plants poisonous to livestock, (b) plants poisonous to human beings, and (c) plants causing dermatitis. [At least 29 of these poisonous plants are to be found in Great Britain.] Brief notes are given on the habits, symptoms produced, and the general circumstances under which each poisonous plant is eaten or handled. Treatment in cases of poisoning is not described.—W. R. MUIR.

BERBER, H. J., SLACK, R., & WIEN, R. (1943). **Increase in Toxicity of Stilbamidine Solution on Exposure to Light. [Correspondence].**—*Nature, Lond.* **151.** 107–108. **1733**

The authors confirm the fact [see FULTON *et al.*—*V. B.* **13.** 143.] that the toxicity for mice of 0·5% solutions of stilbamidine (4 : 4′-diamidino stilbene) increases as much as five-fold in as short a time as four days when they are exposed to light. Strong solutions (*circa* 10%) change much more slowly. It is probable that the reaction which occurs is an addition of the elements of water to the double bond of the stilbene linkage, leading to the formation of a toxic product which is almost certainly 4 : 4′-diamidino phenyl benzyl carbinol, but rigorous proof is difficult. Because the change is associated with the unsaturated stilbene linkage it is not expected that other therapeutic diamidines will show a similar change. An interesting and important observation is that the toxic product is almost inactive against *Trypanosoma equiperdum*. It is emphasized that only very freshly prepared solutions of the drug should be used therapeutically.—D. G. DAVEY.

WELCH, H., SLOCUM, G. G., & HUNTER, A. C. (1942). **Method for Determining the Toxicity of Antiseptics as Measured by the Destruction of Human Leucocytes.** —*J. Lab. clin. Med.* **27.** 1432–1438. **1734**

A method is described for determining the toxicity of antiseptics. They are tested on whole human blood for the action on leucocytes: irreversible loss of the function of phagocytosis following a 10-min. contact with the compound tested is taken as an indication of death to the cell. This method, it is claimed, has the advantage of approaching closely the conditions under which antiseptics act on human tissues.—J. M. R.

HAWKING, F. (1943). **Histological Reactions to Oils and Sulphonamide Preparations.**—*J. Path. Bact.* **55.** 41–52. **1735**

In view of the fact that, for local application, an oily preparation of sulphanilamide has many advantages, a study was made in rats of the histological reactions to various oils and to sulphonamide preparations. Liquid paraffin, cod liver oil, wool fat, linseed oil, and cotton-seed oil used alone caused only a negligible immediate reaction after subcutaneous or intramuscular injection, but they all provoked a delayed connective tissue reaction; the least response was caused by cottonseed oil. Micro-crystalline preparations of sulphonamides caused a small immediate reaction and little or no delayed reaction. It is concluded that the preparation of choice is micro-crystalline sulphathiazole or an aqueous preparation of sulphanilamide with a small amount of oleate or of stearate.—J. M. ROBSON.

ESKOLA, O. (1942). Ueber die Giftigkeit der Wurmmittel im Lichte von Bilirubinuntersuchungen. **[On the Toxicity of Worm Remedies in the Light of Bilirubin Investigations].**—*Acta med. scand.* **109.** 548–565. **1736**

Human infestations were successfully treated with 3·5 g. extract of male fern, 3·5 g. extract of *Aspidium spinulosum*, 10 g. kamala, or 150–200 pumpkin seeds. This was the order of decreasing toxicity for the host. An increase of even 0·5 g. of the first-named remedy caused a marked increase in the toxicity to the host. Bilirubin or urobilin were never excreted in the urine, and urobilogen was only once found in small amounts. Skin icterus was noted in only one case. The degree of serum coloration and the bilirubin in the serum rose simultaneously, but the diazo reaction remained negative. The changes noted were ascribed to a toxic action upon the liver cells.—J. G. CARR.

I. MANN, I., & PULLINGER, B. D. (1942). **A Study of Mustard Gas Lesions of the Eyes of Rabbits and Men.**—*Proc. R. Soc. Med.* **35.** 229–244. **1737**

II. MANN, I. (1942). **Mustard Gas Lesions of the Eyes.**—*Brit. med. J.* March 14th: 353–354. **1738**

I. Extensive observations were made on the pathological effects of mustard gas on the eyes of rabbits and these results were correlated with observations made on human subjects. Rabbits were used as they develop

lesions almost identical with those of man although they require a larger dose than man, but their pathological processes are speeded up in proportion to their shorter life span and therefore it is possible to obtain within a year a result which would take ten years to develop in man. It is concluded that the reaction in man and the rabbit is dependent on the size of the dose and the anatomical situation at which it acts and that the difference between the effects of vapour and liquid is quantitative only. The delayed keratitis which may occur in man is regarded as a degenerative ulceration depending on the initial damage sustained by the limbus and cornea, and not on any continued action of mustard gas or any of its breakdown products. The course of mustard gas lesions in the eyes of rabbits and man is summarized in tabular form and excellent diagrams and figures are given.

II. M. states that there is no essential difference other than that of degree between the effects of the vapour and of a splash of the liquid on the eye, as very prolonged exposure to vapour will cause damage exactly similar to that caused by liquid. Grades of the eye lesion of varying severity, dependent on the size of the dose and characterized by the involvement of certain tissues in a definite order, can be recognized. Generally, the lids and conjunctiva are involved first; with a slightly larger dose, the cornea will show changes, first in its epithelium only, and with a greater dose in the substantia propria as well; with severe doses the limbus is damaged and vascularization of the cornea occurs to a varying degree. These clinical varieties of lesions are summarized and described. It is concluded that the series of changes set up by the gas tends towards self-limitation and spontaneous recovery, the results being better than the initial condition would suggest, even in severe cases incapacitated for months.
—R. ALLCROFT.

See also absts. **1773** (phosgene), **1804** (poison plants of Alberta), **1805**, **1806** (of Queensland), **1805**, **1806** (cattle poisoning by saw-fly), **1813** (industrial poisons).

THERAPEUTICS AND DISINFECTION

—. (1942). **Fifth Supplement to the British Pharmaceutical Codex 1934. Quinine Preparations and Cumulative Index.** pp. 38. London: Pharmaceutical Press. [8vo] [2s. 6d.] **1739**

This contains additions and amendments to the monographs in part I and part II, amendments to the formulae in part III and appendix XIV, and a very useful cumulative index which forms the larger portion of the supplement and facilitates reference to the additions and amendments made in the five supplements.

The main additions to part I are monographs on prepared derris and lonchocarpus, used increasingly for veterinary and horticultural purposes. The amendments to part II allow of the use of synthetic rubber in the manufacture of surgical sheetings and plasters. For part III the amendments involve changes in the formulae for preparations in which quinine (in short supply at present as a result of the war) is not regarded as an essential constituent.—J. M. ROBSON.

STOKES, J. L., & WOODWARD, C. R., Jr. (1942). **The Isolation from Soil of Spore-forming Bacteria which Produce Bactericidal Substances.**—*J. Bact.* **43.** 253–261. **1740**

A simple rapid method is described for isolating "antagonistic" micro-organisms from soil. Low dilutions (1 : 10,000 or less) of soil were plated on a suitable agar medium and incubated at 28°C. for 2–5 days. In some of the cultures, colonies resulted with distinct zones in which the growth of other bacteria was inhibited; these colonies were invariably spore-forming bacteria and the micro-organisms inhibited were generally bacilli or short Gram-negative rod-shaped bacteria, and occasionally fungi. Of 24 strains so isolated and tested for further antibacterial activity against Gram-positive and Gram-negative bacteria, seven were classified as an "active" group whose broth cultures possessed bactericidal properties, and 17 classified as an "inactive" group which were not bactericidal. Between these two groups were constant differences in staining properties and metabolic behaviour. The bactericidal agent of the "active" strains was isolated by the method of DUBOS [*V. B.* **12.** R1–R6]. The amount of bactericidal material present in a developing culture increased with continued incubation until a maximum was reached in about six days. Most of this material was present either in suspension or associated with the vegetative cells, spores, and cellular debris of the culture and could be separated by centrifugation. The isolated agents were found to be highly bacteriostatic for various Gram-positive bacteria, while larger amounts were necessary to inhibit or destroy Gram-negative bacteria, especially those of the colon-typhoid group. It is evident from the data that "antagonistic" spore-forming bacteria are commonly present in soil and can readily be isolated.—R. A.

OXFORD, A. E. (1942). **Anti-Bacterial Substances from Moulds. Part V. The Bacteriostatic Powers of the Methyl Ethers of Fumigatin and Spinulosin and other Hydroxy-,Methoxy- and Hydroxymethoxy-Derivatives of Toluquinone and Benzoquinone.**—*Chem. Indust.* **61.** 189–192. [For part IV, see *V. B.* **12.** 355]. **1741**

OXFORD, A. E., RAISTRICK, H., & SMITH, G. (1942). **Anti-Bacterial Substances from Moulds. Part VI. Puberulic Acid, $C_8H_8O_6$ and Puberulonic Acid, $C_8H_4O_6$, Metabolic Products of a Number of Species of *Penicillium*.**—*Ibid.* 485–487. **1742**

V. In view of the fact that fumigatin was found to be much more potent than *p*-benzoquinone as an inhibitor of the growth of Gram-positive bacteria such as *Staphylococcus aureus* [see *V. B.* **12.** 355.], it was decided to investigate the bacteriostatic properties of all the other hydroxy-, methoxy-, and hydroxymethoxy-derivatives of toluquinone and the corresponding derivatives of benzoquinone. Of the 26 theoretically possible derivatives of toluquinone and of benzoquinone, 15 of the former and seven of the latter were available for testing by the method already described in part III [see *V. B.* **12.** 308]. With regard to their effect on *Staphylococcus* species, the derivatives fell into three groups, the activity of fumigatin being taken as a standard of reference:—(1) quinones which had a markedly weaker antibacterial action than fumigatin, (2) quinones which were somewhat more effective than fumigatin, and (3) quinones with considerably greater activity than fumigatin. This last group includes the following derivatives of toluquinone:—4-methoxy-; 4 : 6-dimethoxy-; 3 : 4 : 6-trimethoxy-; 6-hydroxy-4-methoxy-, and also 2 : 6-dimethoxy-benzoquinone The most active toluquinone derivative was 4 : 6-dimethoxytoluquinone and the most active benzoquinone was 2 : 6-dimethoxybenzoquinone. From the results it appears that the introduction of OCH_3 into the quinone nucleus often results in a great increase in antibacterial activity and the introduction of OH usually results in a decrease in antibacterial activity. The replacement of OCH_3 by OH always results in decreased activity.

VI. It has been demonstrated that metabolism

solutions of all those species of *Penicillium* which give a striking brownish-red colour with ferric chloride suppress the growth of *Staphylococcus aureus* in glucose broth and that this antibacterial activity is due to the presence in the metabolic solutions of puberulic and puberulonic acids. Measurement of the antibacterial potency of pure specimens of these acids against a number of pathogenic bacteria showed that puberulic acid suppresses the growth of a large number of Gram-positive becteria at very high dilutions, while puberulonic acid is active towards the same organisms at much higher concentrations. Neither acid showed much activity against Gram-negative bacteria. The species of *Penicillium* from which these two acids have been isolated are :—*P. puberulum* Bainier, *P. aurantio-virens* Biourge, *P. Johannioli* Zaleski and *P. cyclopium-viridicatum* series. The antibacterial activities are tabulated of metabolism solutions and of pure specimens of puberulic and puberulonic acids against *Bacillus anthracis*, *Bacterium coli-commune*, *Salmonella typhimurium*, *Staph. albus*, *Staph. aureus*, *Staph. citreus*, *Streptococcus pyogenes*, *Str. viridans* and *Vibrio cholerae*.
—R. ALLCROFT.

DE WAAL, H. L., KANAAR, A. C., & MCNAUGHTAN, J, (1942). **Antisulphanilamide Action of Procaine in vivo.**—*Lancet*. **243.** 724–727. **1743**

In experiments in mice procaine has been shown to have an antisulphanilamide action, *i.e.* it has an action similar to that of *p*-aminobenzoic acid to which it is chemically related. This action becomes particularly obvious when the procaine is administered in repeated large doses early in sulphanilamide therapy. The authors suggest that it would be unwise to use massive doses of procaine (or other local anaesthetics allied to *p*-aminobenzoic acid) in cases under sulphonamide treatment, especially early in disease, and in those cases not receiving intensive treatment.—J. M. ROBSON.

DAVIS, B. D., & WOOD, W. B., Jr. (1942). **Studies on Antibacterial Action of Sulfonamide Drugs. III. Correlation of Drug Activity with Binding to Plasma Proteins.**—*Proc. Soc. exp. Biol., N.Y.* **51.** 283–285. [For previous parts, see *V. B.* **13.** 68]. **1744**

The protein-binding power of seven commonly used sulphonamides has been measured by dialysis experiments. A quantitative correlation has been demonstrated between the protein-binding power and the bacteriostatic activity of these drugs.—J. M. R.

I. DOMAGK, G. (1942). **Sulfonamidtherapie bakterieller Infektionen im Experiment und in der Praxis. [Sulphonamide Therapy of Bacterial Infections in Experiment and Practice].**—*Dtsch. tierärztl. Wschr.* **50.** 301–311. **1745**

II. HENSELS, P. (1942). Über chirurgisch-klinische Erfahrungen mit einer kombinierten Prontosil-Omnadin-Therapie. **[Prontosil-Omnadin Therapy of Surgical Diseases of Horses].**—*Ibid.* 312–313. **1746**

III. VÖGHER, R. (1942). Die Sulfonamide in der Kleintierpraxis. **[Sulphonamides in Small Animal Practice].**—*Ibid.* 313–314. **1747**

IV. GÖTZE, R. (1942). Die Sulfonamide in der Buiatrik und in der Geburtshilfe. **[Sulphonamides in Obstetrics and Gynaecology].**—*Ibid.* 314–316. **1748**

I. The sulphonamides in clinical use in Germany are reviewed. They include prontosil and prontosil soluble, sulphanilamide, sulphacetamide, uleron and various of its derivatives, sulphapyridine, sulphathiazole, marfanil (4-aminomethylbenzene sulphonamide hydrochloride), and tibatin (galactoside 4,4'-diaminodiphenylsulphone). The fact that these substances exert a bacteriostatic rather than a bactericidal effect is emphasized as is the fact that the natural defences of the body play an important part in their action. The substrate competition theory of sulphonamide action is discussed, and it is pointed out that the activity of some sulphonamides, *e.g.* marfanil, is not inhibited by *p*-aminobenzoic acid. Data are given on the relative effectiveness of various sulphonamides in the treatment of experimental haemolytic streptococcal infections in mice : by far the best results were obtained with tibatin. Marfanil proved the most potent in the treatment of experimental infections with anaerobic organisms. In veterinary medicine, sulphonamides have frequently been used in insufficient doses. They have been used in strangles, catarrhal bronchitis, purpura in horses, puerperal infections in various animals, streptococcal mastitis in cows, streptococcal septicaemia in lambs and in various infections in cats and dogs. In the treatment of strangles the drugs have been given intravenously, intramuscularly, and orally. Results have not yet been obtained on a sufficient scale to give conclusive evidence of high value. Dosage still requires more investigation. STECK claimed success in equine broncho-pneumonia and LABELLE in joint-ill in foals. Many reports on sulphonamide therapy of suppurating wounds have been favourable, whilst results with bovine mastitis have been poor.

II. It is suggested that prontosil in combination with omnadin increases the natural defences of the body. Good results with this combined treatment are claimed in surgical pyogenic infections and in infectious diseases of the respiratory passages in horses.

III. The use of sulphonamides and their dosage in diseases of small animals are discussed. They have been used locally for sepsis in wounds etc., and in pneumonia, in infections of the external ear, and in infections of the urinary passages.

IV. Various sulphonamides, including globucid, have been used in infectious abortion of cows, but the results are not hopeful. Sulphonamide treatment of mastitis has been disappointing, but tibatin has been found very valuable in improving the general condition of cows with severe mastitis of pyogenic and mixed infection types. In various infections of unweaned animals, daily doses of sulphonamides of 8–12 g. per 100 kg. body weight are recommended. Very good results have been observed in the treatment of puerperal streptococcal infections, especially in horses and pigs ; in cows the results of oral or parenteral application have, however, not been good but local treatment of the uterine cavity with a mixture of marfanil and sulphanilamide appears promising.—J. M. ROBSON.

DOMAGK, G. (1942). Die Sulfonamidtherapie bakterieller Infektionen. **[Sulphonamide Therapy of Bacterial Infections].**—*Hoppe-Seyl. Z.* **274.** 55–65. **1749**

Rats were injected intramuscularly with gas gangrene bacilli and treated locally with various sulphonamides. The best results were obtained with a combination of marfanil (sodium salt of 4-amino methyl benzene sulphonamide) and sulphathiazole, or with the 1,5-napithalene disulphonic acid salt of marfanil. Combinations of sulphonamides containing marfanil were also found to be of great value in the local treatment of experimental infections with haemolytic streptococci, staphylococci, and diphtheria bacilli.—J. M. ROBSON.

MARSHALL, E. K., Jr., LITCHFIELD, J. T., Jr., WHITE, H. J., BRATTON, A. C., & SHEPHERD, R. G. (1942). **The Comparative Therapeutic Activity of Sulfonamides against Bacterial Infections in Mice.**—*J. Pharmacol.* **76.** 226–234. **1750**

The therapeutic activities of 33 typical derivatives of sulphanilamide against a streptococcal infection in

mice have been compared. With the exception of sulphapyridine none of these derivatives was found to be significantly more active than sulphanilamide, while most of them were less active than the parent compound. On a pneumococcus infection, sulphapyridine, sulphathiazole, sulphadiazine, sulphamethyldiazine, sulphapyrazine and sulphaguanidine are all more active than sulphanilamide. There appears to be a definite specificity in the action of sulphanilamide derivatives on bacterial infections in mice. Although all compounds which were active *in vivo* were also active *in vitro*, there appears to be no quantitative relation between *in vitro* and *in vivo* activity.—J. M. ROBSON.

STABLEFORTH, A. W., HIGNETT, S. L., & ROACH, R. W. (1943). **Sulphanilamide in the Treatment of Group C and Group G Streptococcus Infections: Mouse Experiments.**—*Vet. J.* **99.** 42–47. **1751**

Experiments on mice to determine the efficiency of sulphanilamide in the treatment of animal infections with streptococci of groups B, C, and G are described. In the first instance it was necessary to enhance the virulence of the organisms sufficiently for test purposes. This was accomplished with groups C and G, but was unsuccessful with group B. The method which gave best results comprised inoculation of a series of mice with falling dilutions, culture from the heart blood of the mouse which was killed by the smallest number of organisms, inoculation of a further series of mice with a higher series of dilutions, and so on until the required degree of virulence was attained. Sulphanilamide was administered orally in the form of a 10% suspension in 10% gum acacia. A high degree of protection against both groups resulted.—D. D. OGILVIE.

KOLMER, J. A., & BROWN, H. (1942). **Sulfonamide Therapy of Streptococcus Infections by the Intravenous Drip Method.**—*J. Lab. clin. Med.* **27.** 1268–1275. **1752**

The intravenous drip administration of sulphanilamide gave excellent therapeutic results in human cases of haemolytic streptococcal septicaemia but similar administration of sodium sulphapyridine gave unsatisfactory therapeutic results in two cases of subacute bacterial endocarditis due to *Str. viridans*. Intravenous drip treatment was ineffective in rabbits inoculated with virulent haemolytic streptococci as the animals developed suppurative arthritis with septicaemia.—J. M. ROBSON.

STABLEFORTH, A. W., HIGNETT, S. L., WATTS, P. S., PATERSON, J. D., CUNNINGHAM, A., EDWARDS, S. J., MALCOLM, J., & ROACH, R. W. (1942). **Sulphanilamide in the Treatment of Bovine Mastitis due to Str. agalactiae, with Coincident Observations on the Value of Irrigation with Euflavine in Lactose Solution.**—*Vet. Rec.* **54.** 539–542. **1753**

In preliminary experiments with sulphanilamide the best results were obtained when the drug was given *per os* in an initial dose of 1 g. per 5 lb. body weight followed, at eight-hour intervals, by 15 doses of 1 g. per 30 lb. body weight. Eleven out of 23 cows were "cured" (*i.e.* negative to three post-treatment tests over a period of three months) following this treatment.

Field trials were carried out at seven centres and included observations on the value of sulphanilamide given for 5–7 days (as above) and given for 15 days. Udder infusion with euflavine 1 : 10,000 in 4% lactose solution was tested concurrently in some herds and controls were observed. Milk samples were plated on crystal-violet-aesculin-blood agar. Pre-treatment tests included at least two strongly positive results (100 or more colonies of *Streptococcus agalactiae* from 0·5 ml. of whole milk or its equivalent). Post-treatment tests included one carried out in a liquid enrichment medium. 34·8% of 299 cows were "cured" following sulphanilamide given for 5–7 days while 55·2% were clinically cured. 5·7% of 175 controls recovered spontaneously while 9·7% showed spontaneous clinical recovery. Sulphanilamide given *per os* for 15 days gave six bacteriological cures out of 29 cows. Euflavine in lactose (one infusion) led to 41·7% of 72 cows being bacteriologically cured. Toxic symptoms developed in some cows following sulphanilamide treatment, though a large proportion showed little or no ill effect. The average loss of milk attributable to sulphanilamide amounted to 18% for the week of treatment and 9% in the following week.

Results varied from centre to centre but there was a significant advantage in favour of the sulphanilamide-treated animals at each of the larger centres. It is suggested that there was variation in the susceptibility to sulphanilamide of the streptococci concerned. The bacteriological results with sulphanilamide given *per os* compared unfavourably with those obtained by udder irrigation with acridine dyes and with the results obtained with gramicidin and novoxil. The authors conclude "that oral treatment with sulphanilamide cannot be recommended as a routine method for the elimination of *Str. agalactiae* from the bovine mammary gland, but that it has a definite place in the treatment of the associated clinical symptoms, and that for this purpose an initial dose of 1 g. per 10 lb. body weight (180 grains per cwt.) followed by half this dose at intervals of about 12 hours for a few days provides a suitable scheme of dosage".

The results obtained by euflavine-lactose irrigation did not suggest that this method was worth pursuing. —H. E. HARBOUR.

LITTLE, R. B. (1942). **The Treatment of Chronic Streptococcic Mastitis with Various Bactericidal Agents.**—*Ass. Bull. internat. Ass. Milk Dlrs.* **34.** 345–358. **1754**

A critical evaluation of the following drugs is given:—entozon, acriflavine, acriflavine and sugar, trypaflavine, gramicidin, and novoxil, together with technical notes on the administration of each drug. Certain precautions should be taken when chemotherapy is attempted in a herd. In herds under good hygienic conditions the percentage of cures may be high, even as high as 80–90%. On the other hand, in the average herd the percentage of cures may be under 50%. L. emphasizes that the degree of success is likely to depend on strict veterinary supervision, the extent of bacteriological control and the culling of those animals which are resistant to treatment. The failure to remove such animals will be responsible for the reinfection of the cured cows. Failure to cure individual cows may be due to omission of a bacteriological examination to determine the type of organism responsible for the mastitis.

Of the agents tested by L. against infection with *Streptococcus agalactiae*, an alcoholic solution of gramicidin in sterile water was the least irritating and the most effective.—D. L. HUGHES.

PANISSET, M. (1942). Contribution à l'étude du traitement de la mammite chronique contagieuse des vaches laitières. [Treatment of Chronic Mastitis]. pp. 13. Oka, Province of Quebec: Institut d'Oka. [8vo] **1755**

Notes on the production of tyrothricin are given. Twenty-five quarters infected with *Streptococcus agalactiae* were subjected to treatment consisting of the injection of 20 ml. of a suspension containing 30 mg. of tyrothricin. Injections were carried out weekly with a maximum of four injections. Results were judged by

the Hotis test and by plating a loopful of incubated milk on to Edwards' and on to Klimmer's media. The streptococci were typed according to their biochemical reactions. Two quarters were cured bacteriologically after the first injection, 13 after two injections, five after a third, and one after four injections. In two cases the four injections failed to cure the infected quarters.
—B. WEITZ.

DE FRANCISCIS, V. (1942). Azione *in vitro* dei preparati sulfamidici sui germi del genere brucella. [*In vitro* **Action of Sulphonamides on Brucella**].—*Boll. Soc. ital. Biol. sper.* **17.** 301–302. **1756**

The action of streptosil, streptosil-pyridine and streptosil-thiazole [? sulphanilamide, sulphapyridine and sulphathiazole] was tested in four dilutions (10^{-3}, 10^{-4}, 10^{-5}, and 10^{-6}) on broth cultures of *Brucella abortus*, *Br. melitensis*, and *Br. para-abortus*, the treated strains being left for a few seconds, 10 min., and 24, 48 and 72 hours in an incubator before being removed for attempted cultivation on agar.

At the two highest dilutions the latter two drugs were bacteriostatic, but streptosil was not. At a dilution of 10^{-4} streptosil was bacteriostatic and the other drugs bactericidal, whilst at 10^{-3} the same result occurred, though survival time was reduced. [No data on distinctive behaviour of the different organisms.]—J. E.

RODANICHE, E. C., & KIRSNER, J. B. (1942). **The Effect of Sulfonamide Compounds on the Growth of** *Endamoeba histolytica* **in Culture.**—*J. Parasit.* **28.** 441–449. **1757**

Sulphanilamide, sulphadiazine, sulphaguanidine, sulphapyridine, and sulphathiazole exerted a growth-inhibiting effect, particularly marked in the case of sulphanilamide. A remarkable feature of the results was that viable amoebae persisted in all the drug-treated cultures, with the exception of the culture containing sulphanilamide, longer than they did in control tubes, a fact which could not be correlated with the density or specificity of the bacterial flora present in the cultures. Even more remarkable, perhaps, is the fact that *p*-aminobenzoic acid did not inhibit the growth-retarding effect of sulphanilamide. Repeated exposure of amoebae to sulphanilamide resulted in some degree of adaptation of the organism to the drug.—D. G. D.

FRIEDHEIM, E. A. H. (1940). L'acide triazine-arsinique dans le traitement de la maladie du sommeil. **[Triazine Arsinic Acid in Treatment of Sleeping Sickness].** —*Ann. Inst. Pasteur.* **65.** 108–118. [Shorter version appeared in *Schweiz. med. Wschr.* **71.** 116–119. (1941)]. **1758**

In investigating the trypanocidal activity of the di-sodium salt of 2 : 4-diamino-6-(arsono-anilino)-triazine, a substance which has been called triazine arsinic acid (no. 4289), it was found that the drug was approximately eight times more active against *Trypanosoma equiperdum* infections in mice than was tryparsamide. Given intravenously, doses of 0·75–1 g. per kg. body weight killed 10–20% of the mice, whilst they resisted doses of 10 g. per kg. given orally. Dogs tolerated doses of 0·2 g. per kg. given intravenously.

In human sleeping sickness a course of ten injections given during a period of 30 days is recommended. In first stage cases the drug can be given subcutaneously or intravenously. Early treatment intravenously in second stage cases may aggravate the encephalitic symptoms. By mouth the drug was tolerated by man in doses of 0·12 g. per kg., and daily administration over a period of 2–3 weeks gave good results in a small number of patients.

Peripheral sterilization appears to be attained within 24 hours after parenteral administration and within three days after oral administration. The drug produced a rapid diminution in the number of cells in the cerebrospinal fluid. The only toxic effects encountered in human beings were gastro-intestinal disturbances. Albuminuria and disturbance of vision were not observed.—U. F. RICHARDSON.

*CILLI, V. (1941). Saggi di terapia con Congasin (Surfen C) nella tripanosi bovina da cazalboui in Eritrea. [**Treatment of** *Trypanosoma vivax* **Infection of Cattle in Eritrea with Congasin (Surfen C)**].—*Arch. ital. Sci. med. colon.* **22.** 49–69. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **140.** 219]. **1759**

Surfen C given intramuscularly in doses of 40 ml. of a 2·5% solution per 100 kg. body weight was well tolerated by normal cattle, but in *T. vivax* infection deaths might be caused by such doses, owing to the severe disturbance of the health of the animals caused by the trypanosome. The drug failed to sterilize infected cattle, but if given at the beginning of the infection prolonged life. C. mentions that he has used the drug at a concentration of 7·5%.—U. F. R.

GINGRICH, W. D., & FILLMORE, R. S. (1942). **The Antimalarial Effect of Acranil in Birds.**—*Amer. J. Hyg.* **36.** 276–282. **1760**

Sulphonamides have a rather variable effect on the several species of malaria in man. Several diamidines and quinoline derivatives show some plasmodicidal activity. The authors report another drug which may prove of value in the treatment of human malaria. Acranil has the formula 3-chloro-7-methoxy-9-diethylamino-β-hydroxypropylaminoacridine dihydrochloride. It is a yellowish crystalline powder which is readily soluble in water. It has proved successful in the treatment of *Giardia* infection. The authors have tested it on *Plasmodium cathemerium* in comparison with atebrin in female canaries and on *Haemoproteus columbae* in pigeons. When the drug was administered enterally at the rate of five daily doses of 2 mg. to canaries before inoculation with *P. cathemerium*, the incubation period was extended to 12·4 days as opposed to four days in the controls. Twenty-one days elapsed before parasites appeared in the blood when acranil was administered in ten daily doses of 2 mg. during the incubation period; atebrin, used in the same way, delayed the appearance of parasites for 27 days, whilst four days was the incubation period for the controls. 2 mg. acranil administered each day for five days during the acute rise of infection caused the parasites' disappearance from the blood within 3·4 days of the beginning of treatment. Atebrin, under the same conditions, produced the same result in four days. Asexual reproduction was limited by the reduction of the percentage of segmenting stages and the number of merozoites produced by these stages when 10 mg. of acranil was given in divided doses of 5 mg. at intervals of four hours. Five daily doses of 40 mg. acranil produced no visible effect on the number of gametocytes of *Haemoproteus columbae*.—C. H. S.

*REMLINGER, P., & BAILLY, J. (1940). Inefficacité d'un dérivé sulfamidé (Dagénan) à l'égard du spirochète de la fièvre récurrente marocaine et du virus de la maladie d'Aujeszky. [**Inefficacy of a Sulphonamide (Dagenan) against Human Spirochaetal Recurrent Fever and against Aujeszky's Disease in Animals**].—*Maroc. méd.* Sept. Oct. 127–129. [Abst. from abst. in *Bull. Inst. Pasteur.* **40.** 173]. **1761**

Soludagenan [soluble sodium salt of sulphapyridine] was ineffective against the diseases named.—J. E.

VOGT-MOLLER, P. (1942). Behandlung der Hundestaupe mit Weizenkeimöl (Vitamin-E-neuromuskulärer Faktor). [**Treatment of Canine Distemper with**

Wheat Germ Oil].—*Tierärztl. Rdsch.* **48.** 274–275. 1762

Administration of a wheat germ oil concentrate to dogs immediately catarrhal symptoms of distemper were seen did not lower the mortality, as compared with a control group having no dose, but did reduce the incidence of nervous complications. Pure vitamin E as tocopherol had no effect on the mortality or the course of the disease and the beneficial effect of the wheat germ oil reported must therefore be attributed to some factor other than vitamin E.—A. M. COPPING.

I. DOVE, W. E., & SIMMONS, S. W. (1942). **Control of Stablefly, or "Dog Fly", Breeding in Shore Deposits of Bay Grasses.**—*J. econ. Ent.* **35.** 582–589. 1763

II. SIMMONS, S. W., & DOVE, W. E. (1942). **Creosote Oil with Water for Control of the Stablefly, or "Dog Fly", in Drifts of Marine Grasses.**—*Ibid.* 589–592. 1764

I. Certain marine grasses, when broken up by the tides and deposited upon the beaches, furnish very suitable breeding places for *Stomoxys calcitrans* in Florida. Treatment of infested grasses by the spraying of several miles of coast line with a mixture of one part creosote and 3–4 parts Diesel oil resulted in a complete kill of eggs, larvae, and pupae; there was no subsequent breeding of the flies in the treated grasses, since the creosote remained in the grass for 18–30 days, long after fermentation had ceased. Fly population on cattle in the treated area was reduced to less than two flies per animal.

II. A cheaper mixture consisting of an emulsion of 1 part creosote and 3 parts water was used. This treatment was very successful, no flies breeding on the treated areas.—W. MOORE.

I. MELVIN, R., PARISH, H. E., KNIPLING, E. F., & BUSHLAND, R. C. (1939). **Diphenylamine as a Wound Protector Against the Screwworm, Cochliomyia americana C. and P.** pp. 4. Washington, D.C.: Bureau of Entomology and Plant Quarantine, U.S. Department of Agriculture. 1765

II. MELVIN, R., SMITH, C. L., PARISH, H. E., & BARRETT, W. L., Jr. (1941). **A New Remedy for the Prevention and Treatment of Screwworm Infestations of Livestock.** pp. 4. Washington, D.C.: Bureau of Entomology and Plant Quarantine, U.S. Department of Agriculture. 1766

I. This paper describes the use of diphenylamine for protecting wounds of livestock from screwworm infestation, and for treating wounds already infested. Diphenylamine is not a strong fly repellent and does not entirely prevent flies from laying their eggs on wounds, but it kills larvae as soon as they hatch. For this purpose, it is claimed to be much superior to pine tar oil, bone oil, and other fly repellent substances.

II. The findings of the first paper are applied to the compounding of a mixture which will kill screwworms infesting wounds and protect susceptible animal tissues against infestation.

The mixture is prepared as follows:– 35 parts diphenylamine are dissolved in 35 parts benzol, after which 10 parts Turkey red oil are added, and the whole is thoroughly shaken. Finally, 20 parts lamp black are stirred in gradually until a smooth, even mixture is obtained. In treating an animal, the mixture should be swabbed into all parts of the wound, and painted around the wound where blood and wound exudate have made the surrounding tissue attractive to flies. The treatment should be repeated after 1–2 days.

—W. MOORE.

ROBINSON, G. G. (1942). **The Quantitative Interaction of Spray Fluid and Active Principle in Determining the Toxicity of a Pyrethrum Preparation to the Argasid Tick,** *Ornithodorus moubata* **Murray.**—*Ann. appl. Biol.* **29.** 290–300. 1767

Among the factors deciding whether a dose will kill an insect are the total amount of poison entering through the cuticle, the rate of its penetration, and the rate at which the tissues and excretory organs can render it harmless. In instances where toxicity increases with dilution, the factor increased is the rate of entry, due to the larger contact area between cuticle and spray.

The toxicity of a pyrethrum-oil mixture against *O. moubata* was found to depend upon a balance between the inherent toxicity of the active principle and the bulk of the dose applied. The bulk of the dose affects toxicity more markedly at lower dosages where a change in bulk means a change in contact area between insecticide and cuticle. As the bulk is increased, it will eventually cover the whole cuticle and contact will be at a maximum. Further increase in bulk will not increase the contact area. The limiting factor operating in this part of the dosage range is the concentration of insecticide.—W. MOORE.

DEEDS, F., & THOMAS, J. O. (1942). **Studies on Phenothiazine. XI. The Excretion of Phenothiazone.**—*J. Parasit.* **28.** 363–367. [See also *V. B.* **12.** 245]. 1768

In an earlier paper (1938) the authors in collaboration with EDDY had reported that phenothiazine, following its oral administration, was excreted in the urine in part as a water-soluble form of the drug itself, and in part as the system thionol-leucothionol. Later, COLLIER [*V. B.* **11.** 12.] advanced evidence that the drug was excreted as a conjugated product of leucophenothiazone, and consequently DEEDS & THOMAS reinvestigated the problem. They now report that they misinterpreted some of their previous data and that phenothiazone-leucophenothiazone as well as thionol-leucothionol exists in the urine of animals treated with phenothiazine. [COLLIER believes the excreted product is almost entirely conjugated leucophenothiazone; LIPSON (*V. B.* **12.** 721.) found phenothiazine, thionol-leucothionol, and phenothiazone-leucophenothiazone in the urine of treated sheep. See also *V. B.* **12.** R10–R11.]—D. G. DAVEY.

SCHMID, F., & FRANCK, R. (1942). Die Wirkung von Wurmmitteln auf die verschiedenen Strongylidenarten des Pferdes. VI. Cholivetrat. VII. Cuprosolvin. **[Action of Anthelmintics on Horse Strongyles. VI. Cholivetrat. VII. Cuprosolvin].**—*Dtsch. tierärztl. Wschr.* **50.** 421–422. [For previous parts, see *V. B.* **12.** 555]. 1769

The authors claim that "cholivetrat" (a copper-arsenic-aniline compound) and "cuprosolvin" (an ammoniacal copper oxide solution) are efficient anthelmintics. "Cholivetrat" is said to be mainly effective against the larger strongyles and cuprosolvin against trichonemas. Dosage rates are not given.—H. D. C.

HEDSTRÖM, H., & ALSTRÖM, I. (1942). Behandling med kolikulture per os vid tvenne fall av kroniskt förlöpande eksem hos häst. **[Treatment of Eczema in Horses by** *Bacterium coli* **Given** *per os.*]—*Skand. VetTidskr.* **32.** 18–23. [English summary]. 1770

Two heavy horses with chronic moist eczema were found to have a scanty aerobic intestinal flora, so they were treated experimentally with 500 ml., given by stomach tube, of broth culture of *Bact. coli* obtained from the intestine of a healthy horse.

Recovery occurred in two and six weeks respectively, concurrently with the return to normal of their intestinal flora.—J. E.

STUBBS, E. L., & BILTZ, R. O. (1943). **Experiments with Greenmelk in Chicken Leukemia.**—*Poult. Sci.* **22.** 49–52. **1771**

"Greenmelk" is a commercial product composed of succulent cereals and buttermilk. It is stated to be rich in vitamins, protein, and minerals. It is claimed to be of value in the treatment and prevention of anaemia.

Five experiments were carried out in which "greenmelk" was fed to 54 chickens artificially infected with fowl leucaemia. There was no significant effect even when "greenmelk" was fed 45 days before infection.—F. D. ASPLIN.

SHINOWARA, G. Y., DELOR, C. J., & MEANS, J. W. (1942). **Clinical and Laboratory Investigations on the Extract of the European Mountain Ash Berry with Particular Reference to its Anti-hemorrhagic Activity.**—*J. Lab. clin. Med.* **27.** 897–907. **1772**

Administration of the dried berry of *Sorbus aucuparia* and its alcoholic and ether extracts significantly reduced the blood-clotting time of chicks brought to a haemorrhagic state on the Ansbacher diet.

The alcoholic extract (sorparin) was administered with and without bile salts, in 25 periods of medication, to 14 human patients with various types of biliary and hepatic disease. Sorparin was sometimes more and sometimes less effective than bile acids and salts. No permanent cures could be obtained, and sorparin, like bile salts, is not a panacea for chronic gall-bladder and liver disease, although it does dispel symptoms in many patients. No toxic symptoms were encountered.

—W. R. MUIR.

MCGIBBON, J. E. G. (1942). **Bronchoscopic Investigation and Treatment of Experimental Cases of Phosgene Poisoning in Goats.**—*Tubercle, Lond.* **23.** 59–71. **1773**

Pathological observations are recorded on the effects of exposure of 12 goats to concentrations of phosgene gas of 1 : 11,000–1 : 4,000 for 10–20 min. Haemoglobin estimations before and after exposure showed that there was an initial drop in Hb concentration within the first seven hours and then a steady rise until 30 hours, after which approximately normal levels were obtained. Six of the animals were examined and treated bronchoscopically and six were left untreated as controls. The effects of bronchoscopic aspiration of secretions and of bronchoscopic insufflation of oxygen and carbon dioxide were investigated. The common finding in animals which died or in those which were killed after three days was a variable degree of consolidation of the lungs. It was found that two types of inflammatory fluid are produced in the lower respiratory tract as a result of the action of phosgene gas on the tracheobronchial mucous glands and on the epithelium of the "respiratory unit" (1) greatly increased mucus secretion occurred in the proximal airways, and (2) an excessive outpouring of clear oedema fluid was found in the more distal "respiratory unit" spaces. As a result of bronchoscopic observation, P.M. examination, and the apparent benefit of bronchoscopic treatment, it is suggested that the mucus secretion forms plugs in the smaller bronchi and bronchioles which cause obstruction and retention of oedema fluid in the lung spaces. The obstructive agent is mucus and it therefore differs from respiratory poisoning by chlorine and blistering gases in which the obstruction is caused by shed and necrotic mucous membrane. If bronchial obstruction can be prevented or removed by bronchoscopic aspiration, oedema fluid can be got rid of through the airways by the patient's own efforts without the occurrence of consolidation. This form of treatment is suggested as an auxiliary to the recognized therapeutic measures for phosgene poisoning.—R. ALLCROFT.

GREENE, R. (1942). **Cold in the Treatment of Damage due to Cold.**—*Lancet.* **243.** 695–697. **1774**

This is a preliminary paper published in order to describe a new apparatus designed for the treatment of severely chilled, but not frost-bitten limbs. The principle involved is to keep the limb cold while the body is made and kept warm, as it has been found that warmth applied too soon to chilled tissues is harmful. No results are yet available.—J. E.

—. (1943). **Treatment of Phosphorus Burns.**—*Lancet.* **244.** 214–215. **1775**

Text of revised instructions issued by the Emergency Medical Service. The essential treatment takes the form of first aid application of a wound dressing that keeps the affected parts wet until the phosphorus fragments can be removed. Detection of the phosphorus is aided by the application of 1% $CuSO_4$ solution, which reveals its presence by the production of copper sulphide which forms a dark deposit. Irrigation with sodium bicarbonate solution should finally be carried out.

Oils, greases, tannic acid, and dyes are contraindicated.—J. E.

—. (1942). **Treatment of War Injuries. Wounds, Burns, Shock, Poisoning by Gas, with a note on Decontamination.** pp. 60. Rahway, N.J.: Merck & Co. Inc. [8vo] [2nd Revision]. **1776**

This is a digest of recent literature made primarily for American physicians. Veterinary surgeons having to deal with war injuries in animals will find the booklet instructive, though the methods of treatment are counsels of perfection and require modification for veterinary practice.—J. E.

I. THROWER, W. R., & VALENTINE, F. C. O. (1943). **Propamidine in Chronic Wound Sepsis.**—*Lancet.* **244.** 133–136. **1777**

II. MCINDOE, A. H., & TILLEY, A. R. (1943). **Propamidine in Chronic Streptococcal Infection of Raw Surfaces.**—*Ibid.* 136–138. **1778**

I & II. In vitro experiments show that propamidine (4 : 4′ diamidino-diphenoxy-propane-dihydrochloride) possesses a bacteriostatic activity against *Staphylococcus aureus* of the same order as sulphathiazole. The bactericidal activity of propamidine is about equal to its bacteriostatic activity. Concentrations up to 0·1% do not inhibit phagocytosis or cause haemolysis. The bactericidal effect of the drug is not seriously lessened by the presence of pus. Techniques have been developed for the use of the drug (0·1%) in a jelly base or a lanette wax base. Good results have been obtained in the treatment of ten cases of chronic wound sepsis and in 11 cases of persistent β-haemolytic streptococcal infection in which other methods had failed.—J. M. R.

I. FULLER, A. T., HAWKING, F., & PARTRIDGE, M. W. (1942). **The Rate of Absorption of Sulphonamides *in Vitro* and *in Vivo* after Local Application.**—*Quart. J. Pharm.* **15.** 127–135. **1779**

II. FULLER, A. T., HAWKING, F., & PARTRIDGE, M. W. (1942). **The Effect of Various Media on the Rate of Absorption of Sulphanilamide.**—*Ibid.* 136–147. **1780**

I. The absorption of sulphonamides from a compact mass (sulphonamide in a glycerin gelatin base) into a moving stream of water was studied. Sulphanilamide was absorbed quickly at first, but more slowly after 30 hours; sulphapyridine and sulphadiazine were absorbed at low constant rates; sulphathiazole occupied an intermediate position. The compounds were also

applied to surface wounds in rabbits and their excretion in the urine was determined. With sulphanilamide, most of the excretion occurred during the first 24 hours; with sulphapyridine and sulphadiazine, excretion continued at a constant rate for five days or more; sulphathiazole again occupied an intermediate position. It is suggested that the duration of action in sulphanilamide may be too short to produce the optimum effect.

II. Sulphanilamide was applied in various media to wounds in rabbits and its absorption determined by measuring the excretion in the urine. When the preparation was spread as a thin film over a surface wound, absorption occurred rapidly from various types of preparations (in oily base, water in oil emulsion, glycerin gelatin base, oil in water emulsion). When the preparation was embedded in the tissues as a compact mass, the absorption of sulphanilamide was delayed by incorporation in an oily medium or in an oil in water emulsion. Sulphanilamide was rapidly absorbed from a glycerin gelatin preparation (used in burns) and from gauze impregnated with sulphanilamide (suggested for use as a field dressing).—J. M. Robson.

I. —. (1943). **Sterilization of Sulphanilamide Powder.**—*Lancet.* **244.** 247–248. **1781**

II. —. (1943). **Sterilization of Sulphanilamide Powder.**—*Brit. med. J.* Feb. 27th. 263. **1782**

I & II. A fatal case of tetanus, possibly due to infection from a container of a sulphonamide powder applied locally, made it obvious that sulphonamides intended for topical application should be marketed ready sterilized, and in sterile containers. Three methods for sterilizing sulphanilamide powder on a small scale are recommended :– (1) dry heat maintained for an hour in a paraffin bath (this is also recommended for the sterilization of sulphathiazole powder); (2) dry heat maintained at 150°C. for an hour in an electric oven, with precautions to ensure even heating throughout, and (3) autoclaving in a dressings sterilizer.
—J. M. Robson.

—. (1942). **British Standard Specification. Sanitary or Disinfectant Powders.**—*Brit. Stand. Inst.* No. 1013. pp. 8. **1783**

This describes the standard procedure for testing carbolic powders, hypochlorite powders, and other powders. The "other powders", unlike the above-named powders which must also pass certain physical and chemical tests, are given no official standard beyond the requirement of a Rideal-Walker coefficient of at least 0·5.—J. E.

Dahmen, H. (1942). Über die keimtötende Kraft von Chlorsilberdämpfen. **[Disinfectant Action of Silver Chloride Vapour].**—*Arch. wiss. prakt. Tierheilk.* **77.** 378–385. **1784**

The disinfectant action of silver chloride vapour (present as aerosol) is decreased by humidities below 60% R.H., but above this the effect is very appreciable: anthrax spores are killed within eight hours, and the vegetative forms of bacteria tested (*Brucella abortus*, *Salmonella typhi*, *Erysipelothrix rhusiopathiae*, streptococci, staphylococci, *Pseudomonas pyocyanea*) in 2–6 hours. Fowl-pox and pigeon-pox viruses are killed in 4–6 hours. Experiments with silver bromide and silver iodide are in progress.—J. M. Robson.

Suter, C. M. (1941). **Relationships Between the Structures and Bactericidal Properties of Phenols.** —*Chem. Rev.* **28.** 269–299. **1785**

From a consideration of the bactericidal properties of phenolic compounds, using their phenol coefficients as an estimate of their effectiveness on various organisms, it is clear that the phenol coefficient of a compound must depend on several properties which may be physical or chemical or both. The introduction of halogen into the nucleus of a phenolic compound always increases its bactericidal potency; the introduction of an alkyl group produces a rise in bactericidal action followed by a decrease as the carbon chain extends beyond five or six C atoms when *Salmonella typhi* and other Gram-negative organisms are used for testing. For *Staphylococcus aureus* and other Gram-positive organisms, the increase in activity continues irregularly until the compound becomes too insoluble to test. The introduction of halogen and alkyl is more or less independent, *i.e.* if an alkyl group raises the phenol coefficient, a halogen atom increases it still further. The effect of other modifications and variations is also discussed and suggestions are made for further research.—R. A.

See also absts. **1604**, **1663**, **1735** (sulphonamides), **1603**, **1787** (disinfectants), **1734** (antiseptics), **1733** (stilbamidine), **1612** (malaria therapy), **1637** (foreign protein therapy), **1646** (fly control), **1655**, **1736** (anthelmintics), **1801** (phenothiazine), **1814** (drugs in veterinary medicine).

HYGIENE AND PUBLIC HEALTH

—. (1943). **Memorandum on Meat and Milk Production and Control. Prepared by the National Veterinary Medical Association of Great Britain and Ireland.**—*Vet. Rec.* **55.** 33–37. **1786**

The food supplies of Great Britain have, as a wartime measure, been placed under the control of the Ministry of Food. This Ministry purchases animals after grading them at collecting centres. The majority of the smaller slaughterhouses have been closed and slaughtering of cattle, sheep, and pigs is concentrated in central abattoirs.

The inspection of meat is still done by local authority inspectors, the majority of whom are not veterinarians. Under present conditions, the local inspectors have power not to condemn meat but merely to advise the officers of the Ministry of Food, who may reject the advice given. Their legal powers only operate when the meat is distributed to the butcher. This has resulted in a lowering of the standard of inspection and also in some friction. A very small skeleton staff of veterinary inspectors has been seconded to the Ministry of Food to co-ordinate the local authority arrangements for meat inspection.

By-products are not always used to the best advantage and should be under the control of a meat control and inspection service. Adequate port inspection is required; it would ensure the best use of damaged or spoilt cargoes. Active co-operation between the Ministry of Agriculture and veterinary meat inspectors of the Ministry of Food would enable inefficient production and disease amongst food animals to be controlled more effectively. Meat inspection practice should be governed by statute, as in Scotland, and not as in England by memoranda and recommendations which lack legal force.

It is considered that the hygienic production of milk deteriorated during, and in the years immediately before, the present war, and that the changes in legislation due to the Agriculture Act of 1937, which transferred the veterinary control of the Diseases of Animals Acts and the Milk and Dairies Acts from the local authorities to the Ministry of Agriculture, have not brought about any general improvement in the standard of milk hygiene. Considerable saving could be effected by transferring the control of milk production entirely to veterinary officers, assisted as necessary by trained

technicians. Their duties should include advice on housing of dairy cattle, animal management and other matters, and the supervision of hygienic milk production, transport, storage, and bottling.

The supervision of the health and personal cleanliness of workers should remain the responsibility of the medical officer of health.

The following are some of the conclusions made.

"The control services for foods of animal origin are not at present organised upon a basis which enables greatest use to be made of existing knowledge, facilities and personnel."

"Production of animal foods could be increased and their quality, quantity and safety improved if a proper system of inspection and control under technical direction were established."

"Veterinary surgeons are, by training and experience, more adequately fitted to undertake the direction and control of these services than other officers: full use is not being made of their specialised knowledge at the present time."

"A nucleus of highly trained and experienced veterinary surgeons exists in this country, who could be organized rapidly into an effective skeleton service which, with additional professional and lay personnel, could form a most effective meat control service."

"These suggestions are put forward as a result of an investigation which has shown convincingly that, by the establishment of a properly co-ordinated animal health service, control of disease among farm livestock, increased production of meat and milk, and adequate safeguards to the consuming public could be rapidly, economically and efficiently organised."

The following immediate recommendations are made with regard to meat.

"1. In the interests of the consumer, and because of the pressing need for increased efficiency of agricultural production, the present opportunity should be seized to establish effective co-operation and co-ordination between the Ministries of Food, Health and Agriculture.

2. It is urged that plans be immediately formulated for the more efficient control of meat and it is recommended that such portions of these plans as war-time conditions permit should be introduced as early as possible.

3. Greater development of the principle of centralised slaughtering would produce increased efficiency in methods of handling, inspection and control of meat, and the Association urges that there should be a still further reduction in the number of abattoirs.

4. Every effort should be made to secure reasonable uniformity in the standard of meat inspection practised in the country, and veterinary direction and control should be introduced. As an immediate step, the number of veterinary surgeons appointed as area technical advisers to the Ministry of Food should be increased and their services more efficiently co-ordinated with the veterinary services of local authorities. A veterinary adviser to the Minister of Health would assist in effecting this co-ordination.

5. Provision should be made at each slaughtering centre for the rapid and efficient utilization of all by-products.

6. For the better control of disease among farmstock and in the interests of an improved standard of meat, veterinary services concerned with animal health and with meat inspection should be co-ordinated."

The following recommendations are for future developments.

"It is strongly recommended that fewer slaughtering centres should be established and that each should be properly staffed and equipped in accordance with modern knowledge. Only slaughtering centres large enough to ensure full-time working should be in commission. Then a fully efficient system of meat inspection and control will be possible and a full realization of the basic principles of co-operation between producers and public through the channels of a proper inspectorate can be achieved.

In large slaughtering centres a number of inspectors will be required; a Chief Veterinary Officer should be in charge and he should be assisted by veterinary officers supported by such lay detention officers as may be necessary. This type of organisation already exists in a number of centres and has proved its value. The lay inspectors should hold the Certificate of Meat Inspection of the Royal Sanitary Institute or the Detention Officers' Certificate of the Royal Sanitary Association of Scotland, or other approved qualification.

To ensure the liaison needed between the abattoir and the producer . . . early professional contacts must be established between veterinary officers at the abattoirs and veterinary surgeons in the field, whether they be officers of the Animal Health Division of the Ministry of Agriculture or private practitioners. By such proper co-ordination an efficient and satisfactory service of meat production, inspection, and control would be secured."

With regard to milk production and control it is recommended that:—

"The services of veterinary surgeons could be more effective if they were given authority to advise upon and direct methods of milk production, breeding, housing and management of cows, with particular reference to milk quality and the more efficient control of animal disease. By training, veterinary surgeons are competent to undertake these duties, and are already engaged upon other work which brings them into close contact with farmers, whose confidence they enjoy."

—H. E. Bywater.

Mattick, A. T. R., Hoy, W. A., & Neave, F. K. (Undated). **The Sterilization of Milk Vessels by Chlorine in Emergencies.**—*Publ. nat. Inst. Dairy., Reading.* No. 691. pp. 12. **1787**

The authors stress the fact that steam sterilization is the easiest, cheapest, and most effective of all methods of sterilization for dairying purposes and that chemical sterilization should only be resorted to in case of absolute necessity. Chlorine compounds are the only chemicals which can safely be used for this purpose and solutions of sodium hypochlorite are the most suitable and convenient; hypochlorite powders are not recommended.

Chemical disinfectants have little or no penetrative powers and in this respect cannot compare with steam. It is, therefore, absolutely essential that the utensil shall be washed thoroughly before the use of the sterilizing agent. The chief difficulty with chemical sterilization is that organisms lodging in crevices, especially in rusty areas, or in milk films remain unaffected. Unless milk vessels are rinsed in water immediately after use, the efficiency of the chlorine wash will be greatly reduced.

Detailed instructions are given for the sterilization of the various dairy utensils and milking machines.

Consistently good bacteriological cleanliness can only be maintained for short periods with chlorine solutions and utensils should, therefore, be sterilized at least once a week with steam or boiling water.

It is pointed out that care must be taken to prevent the addition to the milk of hypochlorites which can be detected chemically in small quantities.—H. E. B.

Breed, R. S. (1942). **The Whence and Whither of Milk Sanitation.**—*Mon. Bull. agric. Sci.* **33.** 363T–371T. **1788**

A comprehensive retrospective study is made of the development of dairy bacteriology and the sanitary control of milk in the U.S.A. In B.'s opinion, the milk supply of the future will be pasteurized and its safety maintained by laboratory examination. Tests to ensure that the pasteurization has been efficient and that re-contamination has not occurred are likely to be regarded as of fundamental importance. The continuance of dairy inspections is necessary to control milk hygiene. Even although all milk were to be pasteurized, it is regarded as essential that national schemes to eliminate disease organisms at the source should continue to function.—D. D. Ogilvie.

Buck, T. C., Jr. (1942). **False Positive Phosphatase Test from a Thermophil in Pasteurized Milk.**—*Amer. J. publ. Hlth.* **32.** 1224–1236. **1789**

False positives to the Gilcreas modification of the phosphatase test were noted over a period of about five years in the Baltimore City Health Department's laboratory.

It was found that a false positive test may be obtained from properly pasteurized milk as a result of the presence of a thermophilic bacillus. This organism, which closely resembles *Lactobacillus thermophilus* and for which the name *Lactobacillus enzymothermophilus* is suggested, was isolated from four dairies. The organism grows rapidly at 112°F. in skimmed milk.

Production of the bacterial phosphatase begins after 90 min. holding at 142°–144°F. It can be extracted from the organism with water and was destroyed after 1 min. at 185°F. This bacterial phosphatase which may be present in properly pasteurized milk is a different substance from the phosphatase found in raw or improperly pasteurized milk, and it is pointed out that

care should be taken in distinguishing the phosphatases when the phosphatase test is used in milk control work. —H. E. BYWATER.

FUCHS, A. W. (1942). **Milk Control in the Defense Program.**—*Publ. Hlth Rep., Wash.* **57.** 422–431. **1790**

Present-day restrictions in the supply of bottle caps and repairs for milk plants are discussed, and the necessity is stressed for keeping milk uncontaminated in spite of these difficulties. Preparations for securing a safe and sufficient milk supply in the event of air raids are outlined, and reference is made to the danger of sabotage, one method being bacterial contamination of milk by the deliberate introduction of pathogens into the milk plant. The effect of war gases on milk is also referred to. An outline is given of the development of milk hygiene in the U.S.A. since the war of 1914–18 up to the present day.

BARTEL, H. (1942). Besteht die Notwendigkeit für eine gesetzliche Anordnung zur Ueberführung not oder krankgeschlachteter Tiere in ein öffentliches Schlachthaus? **[Need for Legislation to Cover the Removal to Public Abattoirs of Animals Slaughtered in a Sick Condition].**—*Tierärztl. Rdsch.* **48.** 62–65. **1791**

A discussion on German conditions with reference to the Meat Inspection Law. B. believes the law to be adequate but states that its execution is inadequate. —J. E.

GÜRGEN. (1942). Die Auswirkung der neuen Tuberkulosebeurteilung in der praktischen Fleischbeschau. **[Effect of Recent Meat Inspection Instructions Regarding Bovine TB.]**—*Dtsch. tierärztl. Wschr.* **50.** 233–234. **1792**

From experience at the Berlin abattoir, G. relates the effects of the new meat inspection regulations on TB.; these came into force on January 1st, 1941. In 1939, 0·78% of cattle were recognized as cases of fresh haematogenous infection, half of them being animals sent for slaughter under the Ostertag TB. eradication scheme of 1913, which was abandoned in 1940. After this the figure sank to 0·19% and rose again to 0·6% in 1941 after adoption of the new regulations and as a result of the new methods of appraising tuberculous carcasses. During the same period pig carcass detentions for acute miliary TB. rose from 0·02–0·025 to 0·069%, indicating an increase in the incidence of TB. due to the war.

With both ox and pig carcasses the new regulations [see *V. B.* **13.** 62.] have had the effect of saving more meat for processing into food products than previously, bone removal having *inter alia* been increasingly done to minimize loss.—J. E.

•POSTEMA, J. L. (1941). Laboratorium-methoden ter ondersteuning van het organoleptisch onderzoek van vleesch. **[Laboratory Methods of Meat Examination].** —*Inaug. Diss., Utrecht.* [Abst. from abst. in *Wien. tierärztl. Mschr.* **29.** 319]. **1793**

A brief general account of methods of detecting early decomposition of meat.

MÖGLE, E. (1940). Zur Tierkörperbeseitigung in Holland. **[The Disposal of Animal Carcasses in Holland].**—*Z. Fleisch- u. Milchhyg.* **50.** 198–200. **1794**

A review of conditions in Holland where there were in 1940 nine carcass-utilization plants. These are listed and their technical qualities discussed. By law all farm animals which die must be reported. The carcass is then collected in a special wagon and taken to the disposal plant.—J. E.

See also abst. **1678** (air-borne infection).

TECHNIQUE AND APPARATUS

MOLLOR, M., WINTER, J. E., & STEINBERG, P. (1942). **Advantage of Thioglycollate Medium in Routine Diagnostic Bacteriology.**—*Amer. J. clin. Path.* **12.** 571–579. **1795**

Brewer's thioglycollate medium and a brain-heart infusion broth were used for a large number of routine blood cultures and for the examination of P.M. material, in order to contrast the species which grew from each on subsequent plate cultures. The obvious difference in their respective constituents was the 0·1% sodium thioglycollate in the former, as both contained a small amount of agar. The thioglycollate medium was shown to be worthy of routine use in conjunction with other reliable enriched media, as it was occasionally the sole means of making a positive diagnosis, and it also encouraged the growth of streptococci and some pneumococci partly because of its inhibitory action on *Bacterium coli* and staphylococci.—J. KEPPIE.

WALLENSTEIN, W. L. (1941). **Improved Simple Medium for the Cultivation of Tubercle Bacilli.**—*Amer. J. clin. Path.* **11.** Tech. Suppl. **5.** No. 3. 108–110. **1796**

W. describes a culture medium for *Mycobacterium tuberculosis* (human type) containing egg yolk 240 ml., distilled water 80 ml., glycerol 8 ml., and Congo red 2 ml., and states that, with this medium, diagnostic results from suspected materials pre-treated with 3% caustic soda or 5% oxalic acid are available after 10–21 days' incubation.—J. LOCHIEL MCGIRR.

RÖHRER, H., & WINAND, H. (1942). Über die Eignung des Trypsin-Pepton aus Stierhoden (Witte) als Nährbodengrundlage für die Bakteriologische Fleischuntersuchung. **[Suitability of Witte's Trypsin-Peptone from Ox Testicle as Basis for Culture Medium for Bacteriological Meat Inspection].**—*Tierärztl. Rdsch.* **48.** 301–304. **1797**

In connexion with the recently advocated use of a peptone prepared by tryptic digestion of bovine testicle for media for the isolation of the enteric organisms [see HOHN (1940). *Zbl. Bakt. I.* (*Orig.*). **146.** 215.], a commercial dry preparation was found to give excellent growth of organisms when used as a basis for many of the differential media used for meat examination. Members of the enteritis group grown upon Gassner's medium made with this preparation were found to have lost their agglutinability more or less completely. A malachite green + phenol red medium advocated by WOLFFRAM was regarded as superior to the more usual brilliant green + phenol red medium previously used. —J. G. CARR.

WOOLEY, J. C. (1942). **Ventilation of Animal Shelters.** —*Circ. Mo. agric. Exp. Sta.* No. 219. pp. 6. **1798**

A circular setting out the general principles for ventilation of animal houses and advocating the use of flues and adjustable windows. Useful tables are given showing the area of out-take flue required per cow, horse, or pig, and for 100 hens, and the size and speed of ventilating fans for various numbers of these animals. —D. D. OGILVIE.

See also absts. **1584** (cultivation of tubercle bacillus), **1600** (of tetanus bacillus), **1608**, **1609** (of trichomonads), **1665** (casts of blood vessels), **1696** (blood platelet counts), **1734** (toxicity tests of antiseptics), **1789** (milk testing).

MISCELLANEOUS

—. (1942). **Committee Reports Adopted at the 79th Annual Meeting [of the American Veterinary Medical Association], August 24-27, 1942.**—*J. Amer. vet. med. Ass.* **101.** 436–458. **1799**

The following are notes of general interest taken from the reports of the various special committees of the A.V.M.A.

Education.—The ten U.S. veterinary colleges had 2,155 students and 502 graduated during the year. There were 198 students in the two Canadian colleges, where 67 graduated. During wartime the U.S. four-year course is being condensed into three years by the abolition of vacations. It is becoming increasingly necessary to limit admissions to veterinary schools and in this matter it is stressed that more consideration should be given to general aptitude and background for veterinary work and less to scholastic records in accepting new students.

Biological Products.—The committee judges and approves or disapproves commercial biological products placed on the market. This year four are added to the approved list [not given].

Proprietary Pharmaceuticals.—The functions of this committee appear to overlap, or at least resemble closely those of the Biological Products Committee. The P.P. committee therefore proposes to dissolve itself.

Public Relations.—This takes the form of a review of the Association's duties *vis à vis* the wartime situation.

Poultry Diseases.—The A.V.M.A. committee published a plan for increasing poultry and egg production. It was widely disseminated throughout the poultry industry. Several meetings on poultry diseases were organized. The National Poultry Improvement Plan advanced rapidly so that, in 1941, 96% of 16 million fowls were tested for pullorum disease. The great economic importance of infectious bronchitis is commented upon, also recent advances in numerous poultry diseases [this part constitutes a useful review].

Parasitology.—The survey work on animal parasites in the U.S.A. inaugurated by the committee is referred to as progressing; reference is also made to the need to improve training in parasitology at veterinary schools.

Nutrition.—This new committee discusses its task of improving veterinarians' knowledge of nutrition.

Rabies.—The committee did no independent work during the year; it functioned on the National Committee founded in 1941 [*V. B.* **12.** 377]. One member of that committee is engaged in formulating proposals for new legislation, in case a Federal eradication scheme can be organized.

Foods.—This committee has been occupied in proposals for the feeding of animal pets in wartime, and in the testing and adjudging of dog foods.

Nomenclature of Disease and Vital Statistics of Domestic Animals.—The detailed report was not ready for presentation.

Veterinary Preparations, National Formulary Committee.—This committee, concerned with the revision of drugs as carried out by the American Pharmaceutical Association, comments on progress made, particularly on the publication during the year of the National Formulary, 7th edition.

Bang's Disease.—Under the Federal-state control plan about 600,000 cattle were tested monthly. 549 counties in 24 states have reached the modified accredited status and North Carolina is the first state to qualify wholly. Seven states have still no funds for indemnity purposes. Calfhood vaccination was incorporated into the plan in December, 1940 and at July 1942, 128,378 calves had been vaccinated. The committee recommends slight changes in control suitable for war conditions and proposes the gradual dropping of the well established term "Bang's disease" in favour of bovine brucellosis. The committee has been renamed accordingly.—J. E.

REPORTS

CANADA. (1942). **Report of the Veterinary Director General for the Year Ended March 31, 1942.** [CAMERON, A. E.] pp. 45. Ottawa: Govt. Printer. [8vo]. **1800**

Canada continues free from the serious epizootic diseases. TUBERCULOSIS, BRUCELLOSIS and SWINE FEVER control work occupied a great deal of the time of the staff.

REPORT OF THE CONTAGIOUS DISEASES SECTION [BARKER, M.]—No cases of ANTHRAX were reported. 271,232 cattle were tested for TUBERCULOSIS under the Accredited Herd Plan, reactors being 0·08%; 728,528 cattle were dealt with in the course of area testing, with 1·2% reactors, and 136,732 under the Supervised Herd Plan, with 0·46% reactors. Altogether 1,175,050 tuberculin tests were made. There are 1¾ million cattle in accredited areas, *i.e.* where infection is reduced to 0·5% or less. About half the cattle in Canada are under the supervision of the department through one of the TB. control schemes. 2,534 herds are under supervision for the control of BRUCELLOSIS and of these 1,492 herds are free from infection. No cases of GLANDERS have been reported in the past four years.

Outbreaks of SWINE FEVER occurred in Nova Scotia (3), New Brunswick (3), Quebec (9), Ontario (15), and Manitoba (11). 8,682 pigs were slaughtered. There were no cases of DOURINE, nor were any cases of RABIES diagnosed. In Nova Scotia and Ontario there were a few cases of chorioptic and psoroptic MANGE in cattle, but there were no reports of SHEEP SCAB OR EQUINE MANGE.

REPORT OF MEAT AND CANNED FOODS SECTION [MACONACHIE, C.]—There was a further increase in the amount of pork exported, making a total increase in the three years since the outbreak of war of 378 million lb. In the 93 establishments working under the Meat and Canned Foods Act the animals slaughtered were 1,780,733 cattle, 839,163 sheep, 6,339,311 pigs, 1,113,213 poultry, and 510 bison. Carcass condemnations were, cattle 1·36%, sheep 0·34%, pigs 0·22%, and poultry 1·33%. In cattle (36·85%) and pigs (37·13%) TUBERCULOSIS was the main cause of condemnation, while a number of calves (22·28%) and sheep (34·84%) were condemned for emaciation and mucoid degeneration. 47·81% of the calves were rejected as immature and 20·01% of the pigs rejected had arthritis.—J. A. GRIFFITHS.

CANADA. (1941). **National Research Council of Canada. Review of Activities for the Year Ended March, 1941.** pp. 126. Items of veterinary interest pp. 77–83. Ottawa. [8vo] [75 cents]. **1801**

A survey revealed a low incidence of human TRICHINOSIS in the Montreal district, a fact attributable to the Canadian regulations for the cooking of garbage fed to pigs. Similar regulations had been recommended by the New York State Trichinosis Commission [see *V. B.* **12.** 398].

A system of "protective treatment" of sheep against INTESTINAL PARASITES proved successful [no details of this treatment are given]. The development of *Strongyloides papillosus* in sheep and in rabbits was studied.

A survey of pigs passing through testing stations showed that 65–70% are infected with *Ascaris*, while a number harbour *Oesophagostomum dentatum* and *Trichuris trichiura*. An infection with *Eimeria deblieckí* has been found in Prince Edward Island pigs. Studies were being made to determine whether the rate of growth of unweaned pigs is correlated with the haemoglobin level in the blood, whether it can be influenced by iron supplements, and the effects of *Ascaris* infestation.

Trials have confirmed that phenothiazine is 100% efficient in removing strongyles from horses and data on its effect on blood elements have been obtained. A 70 g. dose was found to reduce haemoglobin by 19·4% and the erythrocytes by nearly 35% in 15 days. Tests in pigs have not confirmed phenothiazine as an effective ascaricide; repeated doses were not toxic.

Work on the liver fluke, *Metorchis conjunctus*, of dogs and fur animals, was continued. The life-cycle was shown to be mammal→snail (*Amnicola*)→sucker→mammal.

An active trypsin inhibitor was isolated from *Ascaris*.

Biochemical studies of phenothiazine are described. Analytical methods have been improved. It was found that phenothiazine was rapidly oxidized in the rumen of the sheep and significant amounts of the oxidation product were excreted in the bile. The rate of excretion was used to study various factors in connexion with the administration of phenothiazine to sheep. It was found that catalase and cytochrome oxidase were inhibited by the oxidation derivatives of phenothiazine. It is suggested that the drug acts by poisoning the respiratory mechanism of the cell. This work was being continued and a study was being made of the effect of phenothiazine derivatives on yeast metabolism. Studies on the pharmacology of phenothiazine in the horse have been commenced.

No report on TUBERCULOSIS work is included in the Review for 1940–41.—H. E. HARBOUR.

CANADA, PROVINCE OF ALBERTA. (1940). **Annual Report of the Department of Agriculture for the Year 1939.** pp. 110. Items of veterinary interest pp. 33–36 and 50–52. Edmonton: King's Printer. [8vo] **1802**

REPORT OF THE PROVINCIAL VETERINARIAN [TALBOT, P. R.]—*Horses*.—Diseases mentioned are CONTAGIOUS ABORTION, NAVEL ILL, INFLUENZA, "DISTEMPER", STOMATITIS, and INFECTIOUS ANAEMIA. EQUINE ENCEPHALOMYELITIS vaccinations were carried out and there were no losses from the disease. 918 stallions were registered.

Cattle.—BLACKLEG is said to cause many losses and there were some deaths from HAEMORRHAGIC SEPTICAEMIA.

Sheep.—There were outbreaks of BLACKLEG, HAEMORRHAGIC SEPTICAEMIA and "SORE MOUTH". There were no reports of plant POISONING; this is attributed to there being ample grazing.

Pigs.—HAEMORRHAGIC SEPTICAEMIA, PNEUMONIA, and INFLUENZA outbreaks were reported.

Fur-bearing animals.—Faulty feeding is said to be the main cause of losses. Other causes are DISTEMPER, COCCIDIOSIS, and PNEUMONIA.

REPORT OF THE POULTRY COMMISSIONER [TRAVES, C. W.]—Blood testing and the flock approval scheme were continued. Comparative tests have been carried out to compare the tube agglutination laboratory test and the whole blood agglutination test carried out on the farm. The latter method is considered the more reliable. Flocks with not more than 4% reactors are approved.—J. A. GRIFFITHS.

CANADA, PROVINCE OF ALBERTA. (1941). **Annual Report of the Department of Agriculture for the Year 1940.** pp. 107. Items of veterinary interest pp. 46–48, 64 and 67–69. Edmonton: King's Printer. [8vo]. **1803**

REPORT OF THE PROVINCIAL VETERINARIAN [TALBOT, P. R.]—*Horses*.—NAVEL ILL was more prevalent. EQUINE INFECTIOUS ANAEMIA occurs in the outlying districts. EQUINE ENCEPHALOMYELITIS vaccine was given to 59,758 horses. There were 879 registered stallions.

Cattle.—BLACKLEG and HAEMORRHAGIC SEPTICAEMIA were causes of mortality. Outbreaks of INFECTIOUS KERATITIS have been investigated. COCCIDIOSIS is said to be a problem in some areas. FOOT ROT occurs among cattle fed for marketing.

Sheep.—PARASITIC INFESTATIONS and URINARY CALCULI have been the most frequently reported diseases.

Pigs.—No infectious disease outbreaks are mentioned.

REPORT OF THE POULTRY COMMISSIONER [TRAVES, C. W.]—Comparative blood test work was continued with the same results as in the previous year. The blood testing and flock approval programme has progressed satisfactorily.

REPORT OF THE ANIMAL PATHOLOGIST [LLOYD JONES, T.]—The veterinary laboratory was established early in 1940. This provides a diagnostic laboratory service for the provincial and practising veterinarians and farmers. When necessary, outbreaks of disease are investigated in the field and followed up by research work in the laboratory. Information on means of preventing disease is disseminated through the extension branch. There were 809 specimens examined. 32 of these were TUBERCULOSIS, 16 in cattle and the others in poultry.—J. A. GRIFFITHS.

CANADA, PROVINCE OF ALBERTA. (1942). **Annual Report of the Department of Agriculture for the Year 1941.** pp. 105. Items of veterinary interest pp. 33–36, 50–52 and 53–58. Edmonton: King's Printer. [8vo]. **1804**

Horses.—EQUINE ENCEPHALOMYELITIS caused the death of over 1,000 horses; chick-embryo vaccine has reduced the incidence of the disease. There were 808 registered stallions in the province.

Cattle.—BLACKLEG, HAEMORRHAGIC SEPTICAEMIA, KERATITIS and FOOT ROT were prevalent. POISONING was caused by water hemlock and larkspur.

Sheep.—Losses were caused by BLACKLEG, HAEMORRHAGIC SEPTICAEMIA and death camas POISONING.

Pigs.—Diseases were due mainly to faulty feeding or to PARASITIC INFESTATION.

REPORT OF THE POULTRY COMMISSIONER [TRAVES, C. W.]—Poultry disease is controlled by blood testing with a flock approval scheme for those flocks which are free from disease. Figures given show that over a period of 11 years the reactors to blood testing were reduced from 20·2% of those tested in 1930–31 to 2·6% of the 81,868 tested for hatchery approval in 1940–41.

REPORT OF THE ANIMAL PATHOLOGIST [LLOYD JONES, T. D.]—The diagnostic service examined 1,435 specimens, 490 being live specimens; 555 were pigs and 565 were domestic poultry.

The main diseases found in pigs were PASTEURELLOSIS, GASTRITIS, ENTERITIS, ANAEMIA, PNEUMONIA, infections of the new born, ASCARIASIS, and conditions due to faulty feeding.

The main causes of disease in poultry were PULLORUM DISEASE, TUBERCULOSIS, COCCIDIOSIS, and nutritional disorders.—J. A. GRIFFITHS.

AUSTRALIA, QUEENSLAND. (1940). **Annual Report of the Department of Agriculture and Stock for the Year 1939-40.**—Items of veterinary interest pp. 25–31. Brisbane : Govt. Printer. [fcp] [1s. 3d.] **1805**

REPORT OF THE DIRECTOR OF VETERINARY SERVICES [SEDDON, H. R.]—Special attention was directed to tuberculin testing of cows on farms from which tuberculous pigs were received at the abattoirs. This resulted in a fall in the number of pigs condemned for TUBERCULOSIS.

Some progress was being made in the control of BOVINE CONTAGIOUS ABORTION by blood testing.

The existing system of immunization against TICK FEVER gave good results and " bleeders " were stationed in two new centres. Twenty-six outbreaks of BOVINE CONTAGIOUS PLEURO-PNEUMONIA were reported, but it is believed the actual incidence is higher. The disease was being kept in control by systematic vaccination.

The buffalo fly, *Lyperosia exigua*, is the most important cattle parasite. Owing to favourable weather conditions during 1939, the fly spread eastward from the area it had occupied since 1932. The spread had been anticipated and control measures were taken to check it. The fly was approaching an area which is favourable for its existence and in which control would be difficult.

REPORT OF THE ANIMAL HEALTH STATION, YEERONGPILLY.—The station distributed vaccine for MASTITIS, CALF PNEUMONIA, and BOVINE CONTAGIOUS PLEURO-PNEUMONIA. Blood for TICK-FEVER inoculations was prepared and issued. Seven thousand specimens for diagnosis were examined.

In conjunction with the Poison Plants Committee of the Department the following plants were tested :– *Pimelia tetrastachya* (broom bush), poisonous but unpalatable ; *Ipomea calobra* (weir vine), non-poisonous; *Gastrolobium grandiflorum* (heart leaf), poisonous.

No deaths were reported during the year from SAW-FLY (*Platypsecta interrupta*) POISONING. In addition to occurring in the Maronoa, Leichhardt, and Warrego areas, this fly has also been reported from Amara, 30 miles west of Maryborough and from Barakula, 30 miles west of Chinchilla. It is now known that the larvae are poisonous only when in a dead and rotting condition, due to their having increased beyond the supply of food available for them. It is generally recognized that a dietary deficiency is responsible for cattle's eating the larvae, and some outbreaks have been successfully controlled by the provision of phosphatic licks.

Seven thousand tuberculin tests were applied, 554 being positive. For most of the tests the single intradermal method with synthetic tuberculin was used. All reactors were moved for slaughter to abattoirs.

REPORT OF THE ANIMAL HEALTH STATION, OONOONBA.—Routine diagnostic work was carried out. Owing to the high rainfall, the year was particularly bad for diseases connected with buffalo fly, cattle tick, and sheep blowflies. A spirochaete which is probably *Treponema theileri* was detected in the blood of a bovine animal. The blood was infective to other cattle.

REPORT OF CHIEF INSPECTOR OF STOCK [CAREY, L. D.]—Livestock numbers for the state show an increase over the previous years' figures. TUBERCULOSIS is by far the commonest cause of condemnation of cattle and pigs sent in for slaughter. Underweight and emaciation are the next most frequent cause for condemnation.

REPORT OF VETERINARY SURGEONS BOARD.—The number of veterinary surgeons registered up to June 30th, 1940 totalled 106.—N. P. H. GRAHAM.

AUSTRALIA, QUEENSLAND. (1941). **Annual Report of the Department of Agriculture and Stock for the Year 1940-41.**—Items of veterinary interest pp. 16–21. Brisbane : Govt. Printer. [fcp] [1s.] **1806**

REPORT OF DIRECTOR OF VETERINARY SERVICES [SEDDON, H. R.]—During the year all departmental activities in connexion with animal diseases have been co-ordinated under the Director of Veterinary Services. In addition to the increasing number of routine services the following diseases received special mention.

There were 74 herds listed under the TUBERCULOSIS-free herd scheme, 45 of which were fully accredited. Synthetic medium tuberculin is now used by all officers for testing cattle.

There were 28 herds in the ABORTION-free herd scheme, 13 of which were fully accredited. All reactors must be sent to the meat works or spayed and fattened. Steps are being taken to control the spread of porcine BRUCELLOSIS.

The season was particularly favourable for the cattle tick and there were numerous cases of TICK FEVER. Cattle ticks reached the normally tick-free areas of the Darling Downs. Pirevan has been successfully used against tick fever. *Babesia argentina* appears to be the commonest cause. *Anaplasma centrale* is widespread, but rarely by itself causes disease.

Twenty-eight outbreaks of BOVINE CONTAGIOUS PLEURO-PNEUMONIA were reported. 250,000 doses of vaccine are distributed annually.

The buffalo fly, *Lyperosia exigua*, has now spread along the eastern side of the Gulf of Carpentaria and its hinterland. Losses were again reported due to cattle eating the larvae of the saw fly. No new areas were involved. Departmental officers received special train-in blowfly control measures with a view to launching a campaign for the more efficient control of this pest. A survey was made of the areas in which both body lice (*Linognathus ovillus*) and foot lice (*L. pedalis*) occur on sheep in Queensland. The introduction of phenothiazine marked a big advance in treatment of internal parasites of sheep, particularly in those areas where nodular worm is prevalent.

MACKENZIE RIVER DISEASE and ST. GEORGE DISEASE are two obscure conditions of cattle on which investigations were made. As nothing is known of their cause they are at present referred to by the name of the locality in which they occur.

The Poison Plant Committee carried on its usual work. Among other results it found the following plants to be poisonous :– *Trema aspera* (native peach), *T. virgata* (native peach), *Myoporum acuminatum* (a native shrub), *Solanum Seaforthianum*, and *Phyllanthus Fuernrohii*. The two last are unpalatable.

REPORT OF THE CHIEF INSPECTOR OF STOCK (CAREW, J.]—The cattle population was the highest for 15 years ; the sheep population remained high, and the number of pigs reached a record figure. Owing to the wet season, worm infestation in sheep was prevalent. Sheep lice have been spreading further west.

REPORT OF THE VETERINARY SURGEONS BOARD —The number of veterinary surgeons registered up to June 30th, 1941 was 121, 36 of whom hold degrees or diplomas in veterinary science ; 51 hold diplomas from approved agricultural colleges and 34 are registered by virtue of having practised for five years prior to the introduction of the Act.—N. P. H. GRAHAM.

SUDAN. (1940). **Annual Report of the Sudan Veterinary Service for the Year 1940.** [FISHER, C. P.] pp. 27. [fcp] [Mimeographed]. **1807**

ANIMAL DISEASES.—BOVINE CONTAGIOUS PLEURO-PNEUMONIA hardly came to notice except in merchants' cattle awaiting slaughter or export in closely supervised areas ; the disease is not nearly eradicated, but wide-

spread vaccination has brought it under very effective control. Although RINDERPEST was widespread, losses were not serious, owing to effective use of serum and vaccine. FOOT AND MOUTH DISEASE was again entirely eliminated from merchants' cattle by deliberate infection during the rainy season. HORSE SICKNESS again caused minimal losses as the result of widespread vaccination, although many army animals had to operate in known bad areas [details incomplete, but probably less than 1% of vaccinated animals contracted the disease]. The incidence of all other diseases was at a low level.

ANIMAL INDUSTRY.—The main feature was a considerable increase in the number of food animals exported to Egypt. Exports of cattle rose from 8,057 head valued at £E. 33,987 in the previous year to 11,045 valued at £E. 63,728, sheep from 15,377 and £E. 13,680 to 39,595 and £E. 49,405, and camels from 17,187 and £E. 80,000 [estimated] to 20,745 and £E. 125,000 [estimated]. Exports of hides rose from 1,160 tons valued at £E. 43,273 to 1,265 tons and £E. 65,264; the weight of sheep skins exported fell from 882 to 665 tons, but owing to higher prices the valuation fell only from £E. 48,151 to £E. 41,397; goat skin exports similarly fell in weight from 186 to 132 tons, but the valuation only from £E. 16,033 to £E. 14,149; clarified butter export rose from 725 tons and £E. 36,470 to 840 tons and £E. 46,795.

About 2,350 camels, 24,000 cattle, and 203,000 sheep and goats were slaughtered in "ten large towns". [This is a little above average, and represents probably 25% of abattoir slaughterings.]

The war created appreciable demands for transport animals, and veterinary inspectors purchased 1,600 horses and 5,000 camels for military purposes.

LIVESTOCK IMPROVEMENT.—Selective breeding of indigenous stock, rather than "grading up" with imported sires, continues to be the policy.

EDUCATION.—The year 1940 will be notable in the history of education in the Sudan as that in which the first Sudanese students qualified as veterinary surgeons at the Khartoum Veterinary School. The present course extends over five years and is entirely post-secondary education. Two of these years are spent in the School of Science in company with medical, engineering, and agricultural students, where the non-professional subjects chemistry, physics, zoology and botany are taught, and the remaining three at the Khartoum Veterinary School. The subjects in the final year, in order of importance, are epizoology, animal industry, medicine, surgery, and administrative routine.

—S. C. J. BENNETT.

SUDAN. (1940). **Annual Report of the Senior [Veterinary] Research Officer, 1940.** [BENNETT, S. C. J.]—*Rep. Sudan vet. Serv. 1940.* pp. 23–27. **1808**

GENERAL.—The volume of routine work, which reached its highest recorded point in the previous year, showed no signs of diminishing. No research work was possible.

BIOLOGICAL PRODUCTS.—Issues of BOVINE CONTAGIOUS PLEURO-PNEUMONIA vaccine rose from 36,450 to 39,685 doses, of which less than usual was issued to pastoral areas and more than usual for the vaccination of merchants' cattle. Owing to the difficulty of obtaining sufficient suitable cattle, and to a second successive year of indifferent rains, the output of RINDERPEST serum fell from just over 113,000 nominal doses of 50 ml. (5,660 litres) to 98,500 doses (4,925 litres). The potency, however, was unusually high, and field officers were advised to use it at one-third below standard dosage (with satisfactory results). Demands for RINDERPEST vaccine fell from 165,000 to 124,170 doses, and the quantity of virus issued rose from 2,880 to 4,540 doses. 12,700 doses of FOOT AND MOUTH disease virus were issued as against 10,000 in the previous year. Demands for antrypol (naganol) and diagnostic materials, for the control of camel TRYPANOSOMIASIS, rose considerably, but, owing to the difficulty of obtaining supplies of the drug, only 18,120 units were issued (17,154 in 1939). As usual, most of this was used for treating privately owned camels on payment, but many of these had to remain untreated because army and Government-owned camels had to receive priority. Issues of HORSE-SICKNESS vaccine (obtained from Kenya and distributed from Khartoum) rose from 983 to 2,874 doses, the rise being entirely due to military demands.

SPECIMENS.—The only specimen of special interest was one of *Onchocerca cervicalis* in a case of FISTULOUS WITHERS in a horse. This worm had not previously been identified in the Sudan.

See also absts. **1641**, **1642** (entomology, Southern Rhodesia), **1799** (A.V.M.A. committees).

BOOK REVIEWS

—. (Undated). **An Introduction to Nematology. Section II. Part II.** [Edited by CHRISTIE, J. R.] pp. 243–372. Numerous figs. Babylon, N.Y.: M. B. Chitwood. [For previous parts, see *V. B.* **11**. 575]. **1809**

Section II, part II, which continues this publication, deals with the following:– Life History—General Discussion, by B. G. CHITWOOD; Life History (Zooparasitica)—I. Parasites of Invertebrates, by J. R. CHRISTIE, and II. Parasites of Vertebrates, by A. C. CHANDLER, J. E. ALICATA, & M. B. CHITWOOD; Epidemiology and Sanitary Measures for the Control of Nemic Parasites of Domesticated Animals, by T. W. M. CAMERON; Epidemiology and Sanitary Measures for the Control of Nemic Parasites of Man, by W. W. CORT, E. B. CRAM, & D. L. AUGUSTINE; Anthelmintic Medication for Nemic Disease of Domestic Animals and Man, by W. H. WRIGHT & P. D. HARWOOD; Feeding Habits of Nematode Parasites of Vertebrates, by J. E. ACKERT & J. H. WHITLOCK; and Chemical Composition and Metabolism of Nematode Parasites of Vertebrates, and the Chemistry of their Environment, by T. VON BRAND & T. L. JAHN.

As in preceding sections and parts there is a mass of information contained in the eight chapters of this part, although much of it is written from a strictly zoological viewpoint and is of greater interest and value to the research worker than to the practitioner or student. The extensive bibliographies which close each chapter show that much thought and care have been given to the compilation of the textual matter. The first three chapters are illustrated by several line drawings, mostly reproduced from the papers of other authors; these drawings are clear, have been carefully chosen, and greatly help the reader to follow the text. The editor mentions in his preface that it has been necessary to deviate from the arrangement proposed in the original announcement of the publication and to modify what might seem to be the most logical sequence in the treatment of the subject. Page 372 contains a number of corrections to section I, part III and to section II, part I.—J. N. OLDHAM.

BAKER, E. T., *et al.* (1939). **Equine Practice.** pp. 96. Chicago: Veterinary Magazine Corporation. [8vo] [$1.00]. [Reprinted from *Vet. Med.* May, 1938 *et seq.*] **1810**

This is a "collection of discussions on equine diseases and related subjects", about 30 in number, all of which have appeared at various times from May 1938 onwards in *Veterinary Medicine*. They deal with many of the common diseases of horses in the U.S.A., though the booklet does not amount to anything approaching a systematic manual.

The book provides a very useful review of the points that are of value to veterinary practitioners.

—J. E.

CONN, G. H. [D.V.M., B.S.A.H., Assistant State Veterinarian—Accredited Veterinarian (U.S. Department of Agriculture)]. (1942). **Practical Veterinarian.** pp. 160. 7 photographs. Chicago, Ill.: Breeder Publications. [8vo] [$2.00]. **1811**

This book, written for lay readers, gives a superficial review of diseases of farm animals and how to prevent and treat them. It is designed to make American farmers "disease conscious", but is not as practical as its title suggests.—J. E.

RICE, V. A. [Professor of Animal Husbandry, The Massachusetts State College]. (1942). **Breeding and Improvement of Farm Animals. With Chapters on The Endocrine Basis of Reproduction and Artificial Insemination.** pp. xx+750. 213 figs. 2 appendices. [Numerous refs.] New York & London: McGraw-Hill Book Company, Inc. [3rd Edit.] [8vo] [35s.] **1812**

This book is divided into four sections which naturally comprise the somewhat diverse subject matter included in the terms "animal breeding" and "animal improvement". In section I the author traces the interrelationship of man and animals from before the dawn of history down to modern times. Section II covers the physiology of reproduction and includes chapters which should be of great interest to veterinarians, *viz*, "Fertility", "Reproductive Efficiency", "Parturition", and "Sterility". There is an important chapter in this section by Dr. F. N. ANDREWS on the "Endocrine Basis of Reproduction and Lactation", which incorporates most of the recent advances in this field. He also contributes a chapter on artificial insemination, which summarizes modern developments in the technique and in the growth of organized artificial breeding. In Section III the principles and mechanisms of heredity are described and discussed with particular reference to farm livestock. Section IV deals with the art and practice of animal breeding and shows how the general principles outlined in sections II and III can be applied to the improvement of livestock. Systems of breeding, *viz*, grading, inbreeding, linebreeding, outbreeding etc., are fully discussed and illustrated by reference to pedigrees. The standards to be applied in the selection of various types of farm livestock are described in detail, and while many of the standards laid down have particular reference to American conditions, they are, nevertheless, principles which have general application. The final chapter, "Retrospect and Prospect" is a dissertation on past and future trends in the art and science of livestock improvement. Veterinary surgeons in Great Britain will be interested in the short description given of the American Herd Health Service Schemes, which bear a similarity to the National Veterinary Medical Association Panel Scheme. A useful feature of the book is the selection of references given at the end of each chapter and also at the end of the text. The book is well illustrated and has a good index.

Taken as a whole, the book is a well balanced account of the wide range of knowledge which is required in the successful prosecution of animal breeding. Throughout, there is a judicious combination of pure and applied science, which is reinforced by the rich fund of the author's experience. But the book is more than just a technical treatise on animal breeding. Professor Rice never neglects an opportunity to indicate the broader biological principles of his subject, and the reader is made conscious of the extraordinary plasticity of life and of the fact that, in the practice of livestock improvement, the animal breeder "directs the spark of life itself. The possibilities of his art are almost infinite".

It can be truly said that this is an important book which deserves careful reading by all whose work lies in the field of animal production and development. In particular, its study by the veterinarian, whether student or graduate, should promote a better understanding of the wide range of problems involved in the maintenance and breeding of healthier and more productive livestock.

—N. J. SCORGIE.

JACOBS, M. B. [Ph.D., Food, Drug and Insecticide Administration, U.S. Dept. Agr., 1927. Chemist, Department of Health, City of New York, 1928]. (1941). **The Analytical Chemistry of Industrial Poisons, Hazards and Solvents.** pp. xviii + 661. 110 figs. New York, N.Y.: Interscience Publishers, Inc. [8vo] [$7.00]. **1813**

This book ought to be of interest and value to the vastly increased number of medical men, toxicologists, and industrial chemists now coming into contact with the extensive problems of industrial hygiene arising from wartime production. Sampling procedure and practice are well described, analytical methods for harmful metals are adequately set forth, and the treatment of industrial solvents and related substances is good. The author does not appear to make use of a colorimeter, and depends on eye-matching with standard solutions for his colorimetric determinations. There is a final useful chapter on agents of chemical warfare. Valuable tables at the end of the book deal with safe concentration limits of fumes and dusts in the atmosphere, toxicity data for various gases and vapours, limits of inflammability and explosive range of substances likely to be met with in industry, and the minimal lethal doses of a number of war gases.

The contents are thoroughly covered by some 1,200 references, mostly taken from American publications, and there is a good subject index, although the omission of initials or christian names from the author index may lead to confusion in the case of common surnames.

—J. LOCHIEL MCGIRR.

LEWITUS, V. [Ph.G., B.S., M.A., Instructor in Materia Medica, Columbia University College of Pharmacy]. (1939). **Drugs Used in Veterinary Medicine. Series II.** pp. 64. Chicago: Veterinary Magazine Corporation. [8vo] [$1.00]. [Reprinted from *Vet. Med.* **32.** Nos. 4, 7, 8, 9 & 12, and **33.** Nos. 1, 2, 3, 8, 9, 10 & 11.] [Series I published in 1937.] **1814**

This reprint of a series of articles in *Veterinary Medicine* comprises a useful group of essays on the following drugs :– mercurials, silver compounds, arsenicals, calcium compounds, copper and zinc compounds, salicylates, barbiturates, local anaesthetics, purgatives, insecticides, and medicinal dyes.

The material is up-to-date and includes both the old established, as well as new synthetic, preparations. Pharmacology and general indications are discussed, but relatively little is said about specific application to particular animal disease.—J. E.

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